THE AMERICAN NEPTUNE

A QUARTERLY JOURNAL OF MARITIME HISTORY

1958
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACTS OF CONGRESS OF 24 AUGUST 1912, AS AMENDED BY THE ACTS OF 3 MARCH 1933 AND 2 JULY 1946
(Title 39, United States Code, Section 233)

Of THE AMERICAN NEPTUNE published quarterly at Salem, Massachusetts, for October, 1957.

State of Massachusetts } ss.
County of Essex }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Ernest S. Dodge, who, having been duly sworn according to law, deposes and says that he is the Treasurer of THE AMERICAN NEPTUNE and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by Act of 24 August 1912, as amended by the Act of 3 March 1933, embodied in section 587, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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ERNEST S. DODGE, *Treasurer*.

Sworn to and subscribed before me this 17th day of October, 1957.

CHARLES S. CARROLL, *Notary Public*

(My commission expires July 18, 1958.)

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VOLUME XVIII JANUARY 1958 NUMBER 1

STEAMSHIP *picture collectors and enthusiasts will be interested to know that the Peabody Museum of Salem has acquired, through the generosity of its Fellows, Friends, and Trustees, the Alan B. Deitsch Collection. This magnificent collection, one of the world's largest private accumulations of such material, consists of some* 100,000 *photographic prints and* 8,000 *negatives of ocean-going steamships of all nations. Approximately* 60,000 *of the photographs are mounted in eighty-nine hefty albums; the remaining are loose and roughly sorted in boxes by countries. Among these photographs are many rare and unusual pictures of little-known vessels as well as complete pictorial records of the ships of many of the famous steamship lines.*

Alan B. Deitsch was widely known both there and abroad and his host of loyal friends in all parts of the world assisted him greatly in gathering together this splendid collection over a thirty-year period.

There is another announcement which will appeal to the same group of readers. The Steamship Historical Society has placed duplicate sets of their 'Photo Bank' on permanent loan in the Mariners' Museum and the Peabody Museum. This 'bank' consists of over 5,000 *pictures, post-card size, of steamships of all kinds. It is available to all members of the Steamship Historical Society at the two institutions during their regular open*

hours. Questions concerning the 'Photo Bank' should be sent to E. A. Patt, Executive Secretary of The SSHSA, West Barrington, Rhode Island.

A letter from Thomas J. Tobias, 21 *Gadston Street, Charleston, South Carolina, tells us that he is writing a history of that port 'and would appreciate hearing from anyone having diaries, letters, or other records concerned with commercial maritime activities relating to Charleston from early times to the present (exluding naval activity).' Possibly some of our readers can be of assistance to him.*

We are encouraged to start off the new year and the new volume with the knowledge that our appeal in the last number has brought forth some results. One of our subscribers has given us a generous donation to help keep the NEPTUNE *going and we have had some excellent suggestions for additional advertising from another which we will follow up. Incidentally, some of our subscribers may be unaware that the* NEPTUNE *is a charitable corporation under the laws of the Commonwealth of Massachusetts and that gifts to it are therefore tax deductible.*

ERNEST S. DODGE

Peabody Museum of Salem

From River Clyde to Unimak Pass: Ship Star of Falkland

BY HAROLD HUYCKE

THE last big shipbuilding boom in Great Britain, which turned out quantities of deepwater sailing ships, was well under way late in 1891 when William Hamilton & Company, of Port Glasgow, Scotland, launched the big, steel, full-rigged ship *Durbridge* and towed her to the outfitting dock in the Clyde. Potter Brothers of London had placed an order with Hamilton for two full-riggers of 2,000 gross tons each, and had taken delivery of the first one, *Dunsyre* prior to the completion of *Durbridge*. The shipyards along the narrow Clyde were busy with the construction of steel ships, four-mast barks and a quantity of barks, orders for which had been placed by British and European shipowners who, for the most part, still felt there was a big place for large wind-driven ships in the face of growing steam competition. The boom began to wane within a year after *Durbridge* was completed, but not before many dozens of that type were built and sent out to sea with the cargoes that the steamship owners were seeking.

Potter Brothers also owned *Blackbraes*, *Hereward*, and *MacCallum More* and continued to buy ships during the next decade as their fortunes warranted.

Durbridge originally measured as follows: Length, 276.8 feet, breadth, 42.0 feet, depth, 24.2 feet. Gross tonnage, 2,201; net tonnage, 2,121; under deck, 2,072. She had a carrying capacity of about 3,900 long tons. As built, her forecastlehead measured 36 feet, her poop 41 feet. She carried three royals above big, single, topgallant sails, and double topsails, giving the appearance of a heavily rigged ship. She set three jibs on the spike bowsprit, which was common enough by that time. For most of her career she sailed the various oceans of the globe without a wheelhouse or charthouse, her open poop affording few luxuries and little comfort to her crews.

Hers was a varied career, as will be seen in the following account of her thirty-seven years at sea. With the notable exception of a single voy-

age, *Durbridge* did not qualify for that overloaded category, the 'clipper ship.' Lubbock states in his well-known book, *Last of the Windjammers*, that, because she was a large full-rigger of over 2,000 tons measurement, she was not a fast sailer. For the most part, a study of her voyagings bears out his observations.

Potter Brothers were shipowners who, like a great many of their contemporaries, kept their fleet actively employed in general tramping with bulk cargoes. The main source of mechanical steam power in the last years of the last century was coal, and *Durbridge* carried her fair share of this commodity. Europe's breadbasket had been found in the fertile fields of Australia, California, Oregon and Washington, and it was to these far shores that the big ship went for cargoes of grain. The Pacific Northwest regions of the United States provided an unlimited supply of fir, cut in those days within reach of salt water and exported by the hundreds of shiploads to Europe and lumber-hungry regions of Australia, South Africa and South America. *Durbridge* carried that commodity too on at least one occasion. From the arid strip of the Chilean coast she loaded nitrate for Europe, to be used for explosives or fertilizers. And when the economics of the shipping business allowed, she picked up a general cargo, more and more of which were going to steamers. So, from one continent to another, this ship plodded her way, for more than three decades, carrying the commodities of commerce that her owners found for her. (Plate 1)

Durbridge was launched on 17 December 1891. New Year's Day, 1892, found the new ship at the outfitting dock near Hamilton's yard, with riggers at work swinging her royal yards into place, and reeving off the rigging of wire, chain and manila, that completed the intricate machine for harnessing the wind's power. The Potters sent Captain R. Little to join the ship as first master, and to see to the finishing of her outfitting. After the middle of the month of January the ship was near completion. Captain Little shipped his mates and crew and, on 22 January, took the towline of a tug and was warped out of the dock at Greenock and towed into the Irish Sea. Three days later she arrived at Cardiff. For her initial voyage her owners had fixed her to load coal for Rio de Janeiro, sailing from Cardiff on 13 February. The outward passage was made in forty-one days. She then sailed to Newcastle, New South Wales, and loaded another coal cargo, this time for San Francisco. From Rio to Newcastle she took sixty-six days; from Newcastle to San Francisco, eighty-eight days.

Though it has been reported that Captain R. Little was the first master of *Durbridge*, it was Captain H. T. Bridgman who finally brought her

into San Francisco. Where the change of masters was made has not been recorded. When Captain Bridgman backed his main yard outside the Golden Gate after eighty-eight days at sea to pick up the pilot and dicker with a tug for a tow inside, he had no way of knowing that his ship would spend her last years hailing from this California port as an American ship.

It was 13 December 1892 when the ship arrived, and was towed inside and anchored off the city of San Francisco. After discharging her cargo of coal, she loaded a cargo for Liverpool and sailed on 7 March 1893. Such a delay of nearly three months did not involve the expense that a shipowner would be faced with today. The maintenance of an engine room was no problem, there being none. The chances are that within a week the famous waterfront crimps had accounted for his crew, and the various members were soon outward bound on any number of ships before they had a chance to count their pay-off—if, indeed, they waited for it.

What her homeward cargo was, we cannot say, but it was doubtless grain. *Durbridge* sailed home to Britain in one hundred and forty-one days, following over the old route around Cape Horn.

Six weeks after arriving at Liverpool, the big full-rigger shifted down to the Welsh coal port of Cardiff, arriving on 15 September 1893. Her first round voyage since first leaving Cardiff in February of the previous year had taken a year and seven months. Then there followed a series of passages that took her to the continents of Africa, Asia and North America during the next three years. There is no record of cargoes carried, but it is not out of order to speculate with some degree of accuracy as to what they might have been.

Captain Bridgman took her from Cardiff to Table Bay in fifty-five days, arriving on 7 December 1893. Her voyages thereafter are listed as follows:

1894	19 January	Sailed Table Bay
	21 February	Arrived Adelaide, 33 days
	24 March	Arrived Melbourne
	5 April	Sailed Melbourne
	4 August	Arrived London, 121 days
	13 September	Sailed London
	23 October	Arrived New York, 40 days
	14 December	Sailed New York
1895	31 May	Arrived Shanghai, 168 days
	5 July	Sailed Shanghai
	14 August	Arrived Portland, Oregon, 40 days

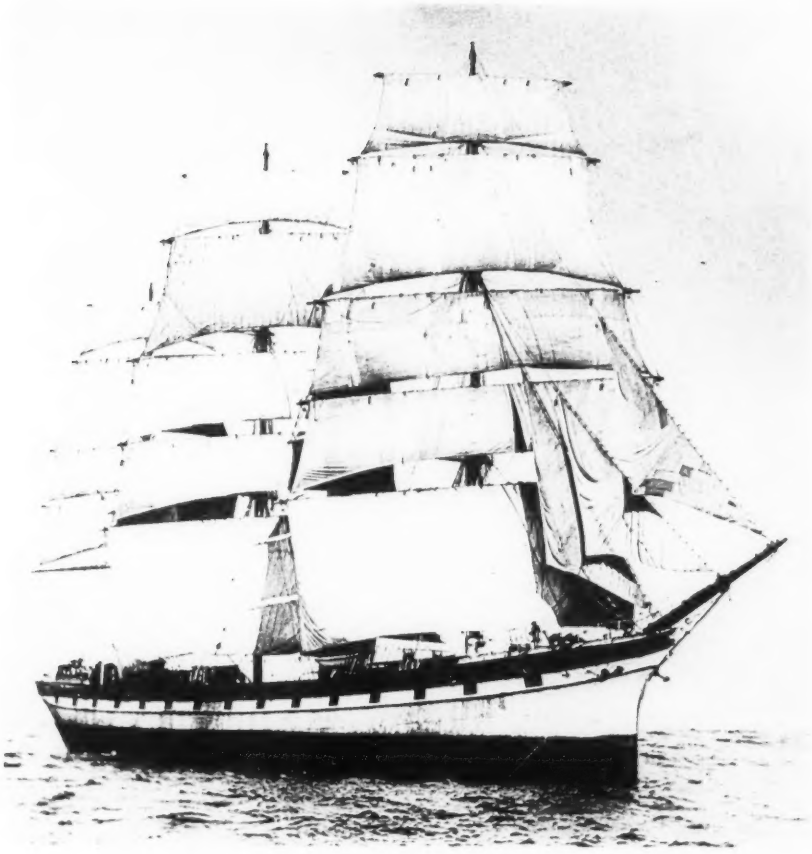
	5 October	Sailed Portland
	11 October	Sailed Astoria
1896	12 February	Arrived Avonmouth, 124 days.

That voyage from Melbourne to London was probably with a wool or grain cargo. Upon completion of that voyage she sailed to New York, and the very nature of her next voyage from New York to Shanghai indicates she had been chartered by the Anglo-American Oil Company or Standard Oil Company for a cargo of case-oil to the Chinese port. One hundred and sixty-eight days was longer than usual on this route, but in that era of sail, those voyages from the Atlantic Coast of the United States to the coast of China, Japan or Korea were about as long as a sailing ship might be called upon to make. The transport of case-oil was a growing trade, for the Oriental demand for kerosene and petroleum products was on the increase.

From Shanghai, *Durbridge* probably sailed to Astoria in ballast. Grain was the commodity moving from the Columbia River's hinterland, and the big stern-wheelers serving as towboats, *Ocklahama* and her sisters, were kept busy pushing the many empty ships to Portland's grain wharves, returning them to anchorage off Astoria deeply loaded.

About the time *Durbridge* completed her voyage from Oregon to Avonmouth, Captain Bridgman was relieved by Captain John McLauchlan, a native of Nova Scotia. This mariner had completed about twenty-one years at sea when he assumed command of Potter Brothers' big carrier, and toward the end of February 1896 shifted to Cardiff for a full load of coal. Once again, in a North Atlantic winter, he towed to sea past Lundy Isle and set sail for Cape Town. The South African port was reached in sixty-four days. After the coal was out, *Durbridge* set out on a long ballast passage to the Columbia River. Her owners had made good timing in their charters. Though *Durbridge* was not earning freights for them while sailing across two oceans in ballast, the prospect of a lucrative cargo was worth the risk.

Captain McLauchlan dropped his pilot outside Cape Town on 9 July 1896 and arrived off the Columbia River lightship on 3 October after a creditable passage of ninety-one days. His experience in the Pacific stood him in good stead, and his efforts toward a quick passage were somewhat rewarded. The harvest of grain was beginning to pile up and *Durbridge* obtained a charter to load for Liverpool. Less than a month was spent in the river while she loaded. Sibson & Kerr provided the cargo, 81,073 centals valued at $100,000, and carried by the ship at a rate of £1 10s. It was not the best rate of the season, but fair enough. Some ships got less.

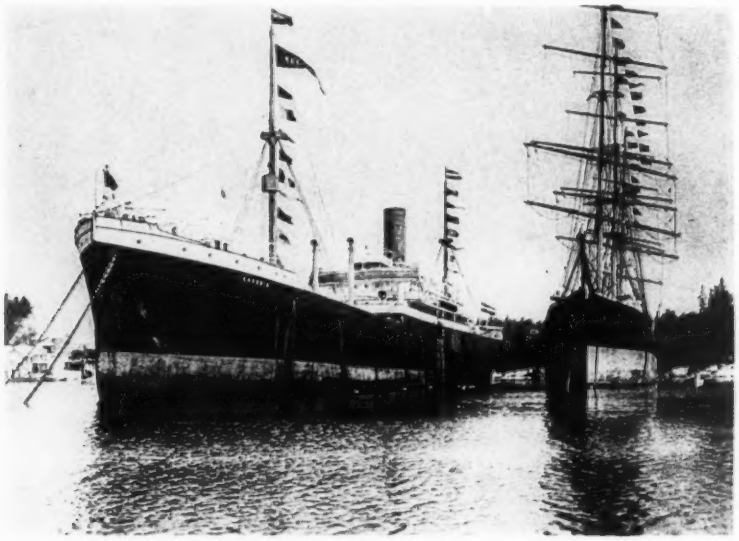


British ship *Durbridge* arriving off Cape Flattery, May 1902, and passing towline to a tug

Courtesy of Mrs. G. R. Sands

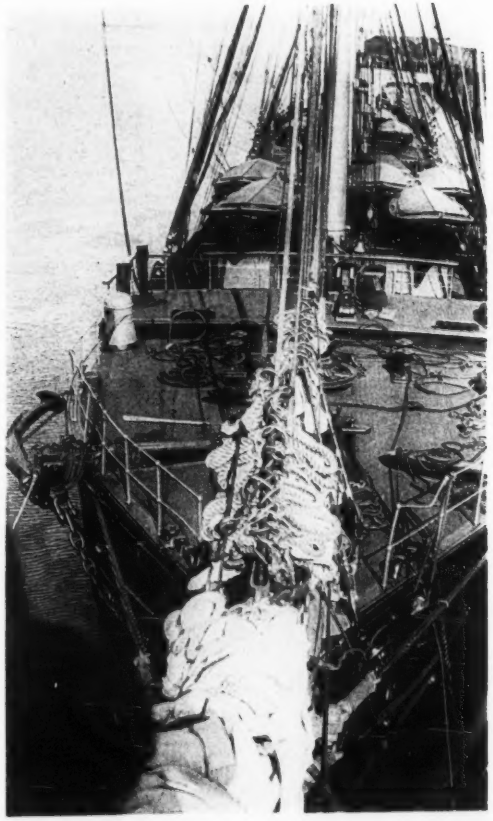
German ship *Steinbek* and S.S. *Saxonia* in Winslow Harbor about 1915-1916

Courtesy of E. Maassen



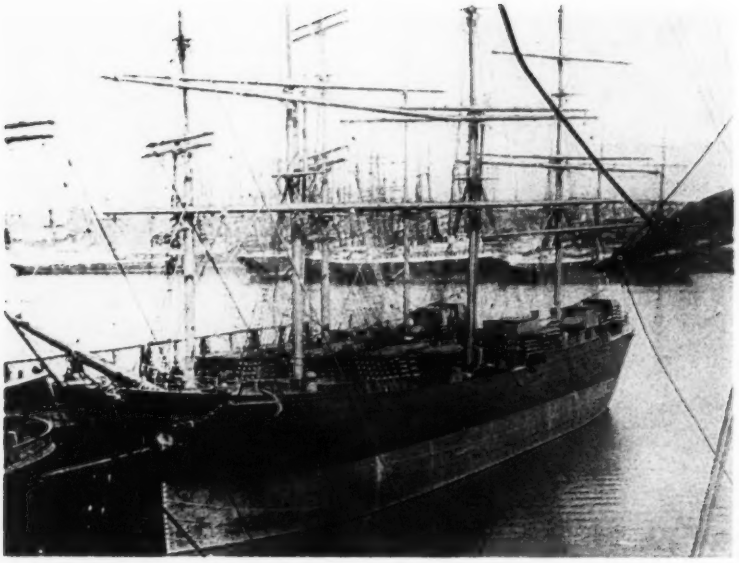
Saxonia and *Steinbek* in Winslow, Washington, 'dressed' for the Kaiser's birthday, 27 January 1916

Courtesy of E. Maassen



Left, Figurehead of ship *Star of Falkland*; *right*, *Star of Falkland* at Pier 50
San Francisco, loading for Alaska, 11 April 1927

Courtesy of Joseph Johnson



Star of Falkland laid up in winter quarters, Fortmann Basin, Alaska Packers Association yard, Alameda, California

Courtesy of the San Francisco Maritime Museum

Wreck of *Star of Falkland*, Akun Head, Unimak Pass, summer of 1928

Courtesy of The Mariners Museum

Durbridge finished her loading and left Portland on 30 October. After part of a day's run down the river in tow, she anchored off Astoria for nearly a week while a crew was rounded up and the ship made ready for sea. Finally, on 6 November, she towed out over the bar in company with the Danish bark *Havila*, bound for Cork, the British bark *Meinwen*, bound for Falmouth, the British ship *Fulwood*, also for Cork, and the British ship *Annesley*, for Cork. The following day the British ship *Narcissus* sailed from the Columbia River for Falmouth.

That same day, 6 November 1896, the small British bark *Glenogle* cleared Victoria, British Columbia, for Liverpool with a cargo of canned salmon. The next day a pair of grain ships left Puget Sound: the big four-masted ship *Liverpool*, bound for Cork, and the four-masted bark *Drumcraig*, to Falmouth for orders.

This fleet of nine ships, all sailing within a few days of each other and from the Pacific Northwest, had the makings of a race. How did they arrive? The Dane, *Havila*, completed her passage in 114 days, with *Meinwen* one day longer with 115 days. *Durbridge* arrived at Liverpool on 10 March 1897, 124 days from Astoria, while *Glenogle* arrived in the Mersey three days later, 127 days from Victoria. *Narcissus* was 127 days to Falmouth; *Liverpool* took 129 days to Cork. *Drumcraig* was 137 days on the passage from Puget Sound to Falmouth, and the ship *Fulwood* took the longest time of this group with 138 days from the Columbia River to Cork.

After discharging at Liverpool, Captain McLauchlan shifted down to Barry for what was doubtless another coal cargo, sailing on 8 May 1897 for Table Bay. The passage out consumed sixty days. On 7 July she entered the Bay, running in under topsails before a northwest breeze, then rounded to and brought up on both anchors. There were other anchored ships in the stream, from whose decks many critical eyes watched her approach. 'A foolhardy business,' some described it, while from others: 'A fine bit of seamanship.' It all depended on your experience, ability, nerve and point of view.

The bark *Galgorm Castle* for whom Potter Brothers were operating managers was also in port. Her master, Captain James Mahon, was a 'Bluenose' so a certain amount of ship-visiting was inevitable.

After discharging in Cape Town during most of July, all of August and the first half of September, Captain McLauchlan received orders to proceed once again to the northwest coast of the United States. His passage thence did not approach the good performance of the previous year. Sailing on 14 September 1897 from Cape Town, the ship took all the rest

of that year to complete her passage, arriving off the Columbia River on 2 January 1898, 110 days out. Prior to her arrival she was fixed by her owners to load 2,121 tons of wheat at 24 shillings, 9 pence, for discharge at United Kingdom ports, Havre, Antwerp or Dunkirk. This was another way of saying 'Falmouth' or 'Queenstown for orders.'

Before the end of January 1898 *Durbridge* had loaded a grain cargo and was towed to sea from Astoria on the 26th, bound to Queenstown. The voyage around Cape Horn took 138 days, with arrival being made on 13 June. *Durbridge* lay in Queenstown, Ireland, for several days before her orders came to discharge at Le Havre.

The big Standard Oil Company and its subsidiaries were chartering some of the largest ships afloat, both sail and steam, for their Far East trade, and Potter Brothers were able to get a charter arranged for their big ship to load in New York. In ballast the ship sailed from Le Havre and made a summer crossing in forty-nine days, arriving in New York on 9 September. From New York, whence she sailed on 20 October 1898 to Shanghai, *Durbridge* took a period of time in excess of six months before she made her approach to the Chinese port. Her time was 202 days, exceeding the average passage between those two ports.

After the case-oil cargo was delivered safely to its consignees, Captain McLauchlan took his ship to sea, beating out through the China Sea and along the Japanese coast to northern latitudes and the United States. With fair winds and probably in ballast, *Durbridge* attempted to beat her poor performance of the previous passage and crossed from Shanghai to Astoria in thirty-eight days, arriving on 20 June 1899.

Some delay was encountered in getting a tow up the river to Portland. Captain McLauchlan anchored in the river opposite the town of Astoria, and no doubt lost his crew to the boardinghouse masters of that city. Within two weeks *Durbridge* was moored to a grain berth and soon the Oregon wheat was being loaded. Nearly two months were thus spent, and by the end of August Captain McLauchlan prepared his ship for sea and shifted downstream to await completion of his crew at Astoria. Finally, on 3 September 1899, he sailed for Queenstown for orders, on the old, familiar route around the Horn. Her passage home required 134 days, and this was the ship's sixth rounding of the famous Cape; her fourth voyage from Oregon to North Europe.

After discharging at Barrow she loaded a coal cargo at Cardiff for Table Bay. The passage out took fifty-one days. Captain McLauchlan was then ordered to Melbourne for a homeward cargo. Starting at Car-

diff, *Durbridge*'s movements for the next few voyages are set down as follows:

1900	25 March	Sailed Cardiff
	14 May	Arrived Table Bay, 50 days
	10 September	Sailed Table Bay
	23 October	Arrived Melbourne, 43 days
	11 December	Sailed Melbourne
1901	14 April	Arrived London, 124 days
	19 June	Sailed London
	30 July	Arrived New York, 41 days
	4 October	Sailed New York
1902	26 March	Arrived Shanghai, 183 days

It can be seen that the long haul of one hundred and eighty-three days from New York to Shanghai was done with a saving of almost three weeks compared to her last passage over that course.

Lying in Shanghai with *Durbridge* in the month of April 1902 was the British four-mast bark *County of Caithness* under the command of Captain Buchan. Both ships were finishing up their discharging about the same time and both were to proceed in ballast to Cape Flattery and Puget Sound. This had all the makings of a race, upon the outcome of which the masters laid a wager. The standard item of betting amongst shipmasters was at least a hat, and if their inclinations and accounts permitted, something more would be put on the line. Captain Buchan took his *County of Caithness* to sea on 14 April, followed five days later by Captain McLauchlan in *Durbridge*. Available records show *Caithness* arriving at Royal Roads, British Columbia, actually five days after the arrival of *Durbridge*.

The late Basil Lubbock gives *Durbridge* credit for making this passage in twenty-six days and, indeed, the shipping intelligence of the times states that the full-rigger did make the passage in twenty-six days. However, Lloyd's List gives the date of departure from Shanghai as 19 April 1902 and arrival at Victoria, British Columbia, 18 May. This would make a passage of twenty-nine days. Even the *Tacoma Daily Ledger* got confused with the dates but carried the following account of the visit of *Durbridge* to that city.

> The British ship *Durbridge*. . . . has the distinction of having made the fastest voyage on record from Shanghai to Puget Sound in twenty-six days. Shortly after *Durbridge* arrived at Royal Roads she proceeded up Sound to load a cargo of wheat here for Kerr-Gifford and Company for South Africa. So far as is known her twenty-six day passage from Shanghai across the Pacific is the fastest voyage ever made by a

sailing vessel. Instead of following the usual route of the sailing vessel and striking out into the Pacific as soon as possible, Captain McLauchlan kept to the North'ard, skirting the Japanese coast taking advantage of wind and currents and getting as far North as about 50.30 North latitude, virtually following the Great Circle route, arriving at Royal Roads on 31st May.[1]

This last voyage of the *Durbridge* shows in all the sharper contrast when taken with the voyages of the British bark *Tweedsdale*, now in port, or the *Sam Skolfield II* now at Port Townsend. The *Tweedsdale* sailed from Hong Kong, which is about three hundred miles South of Shanghai, on 8 January and did not reach the Sound until June first, being about five months en route, and getting as far south as Pitcairn Island. The *Skolfield* left Manila on 12 December and arrived Puget Sound on 19 May, via Yokohama, having been about six months.

Captain McLauchlan is an old mariner of twenty-seven years experience and he knows the whole Pacific Ocean probably as well as the average Tacoma man knows Pacific Avenue. . . .

To the sailorman the *Durbridge* is known as a 'good ship,' one upon which the sailor is well treated and where food is good. But after over a quarter of a century's experience, Captain McLauchlan says he is beginning to wonder if it pays.

Durbridge lay in Royal Roads for three weeks before she was taken in tow by the well-known and powerful tug *Lorne* for the trip to Tacoma.

In the early years of the twentieth century Tacoma was the leading port on Puget Sound. It was the headquarters of the Northern Pacific Railway, and the terminus for the long trains of wheat moving out from the interior plains of Washington and Oregon. Kerr-Gifford and Company, a large shipper of grain in the Northwest, chartered *Durbridge* for a full load, at 24*s* 9*d*, to be discharged at Cape Town, South Africa.

She was not long in taking her cargo. She was berthed at the London Dock, one of many long grain wharves close by the city, and no delay was encountered. The season for grain had just begun, and hers was only the fifth cargo to be cleared from the port in the month of June. On 18 June the loading was completed and Captain McLauchlan shifted the ship to the stream to get her ready for sea. Two days later he cleared at the Customhouse, his manifest showing a complete cargo of 35,493 bags of wheat, the equivalent of 133,462 bushels, all valued at $100,000.

A tug was ordered for Saturday, 21 June, and in the afternoon, on schedule, *Durbridge* was towed to sea, leaving only four ships in port behind her. Her stay in port was short and the dispatch was swift. It would not be so on her next call on the waters of Puget Sound.

Tacoma's best-known and probably most prosperous ship chandler at

[1] In the shipping columns found elsewhere in this newspaper, *Durbridge* is shown to have arrived at Royal Roads on 18 May. So, regardless of the different arrival dates shown in the daily newspaper, it is safe to assume the ship did make the passage in twenty-six days.

the time was Mr. J. C. Todd. Evidence at hand shows him to have been a go-getter for business and he solicited all the shipping in the port. Captain McLauchlan did some business with him too. The tow from Tacoma to Cape Flattery was a long one and Captain McLauchlan was being aided by a Puget Sound pilot who assisted in conning the ship through the channels. On nearing the open sea Captain McLauchlan had a little time to go to his cabin to pen a short note on the following day, addressed to the well-known supplier of ships, Mr. Todd.

22 June 1902, Noon. Mr. Dear Mr. Todd; I am now off Cape Flattery and soon going to make sail, and trust to make a good passage to Cape Town, and dear boy, hope to see you soon again as you have treated me well in all respects while in Tacoma. Trusting we will meet again, soon, Yours faithfully, J. McLauchlan.

With that, Captain McLauchlan sealed the envelope and stumped back up to the poop, where the pilot was getting ready to board the tug and return to the inland waters of the Sound. Yes, the pilot would be glad to mail the note for him, and poked the envelope in an inside pocket. The tug's towline was dropped when Cape Flattery and Tatoosh Island were well on the port quarter and a fair wind in prospect. Three clouds of white steam from the tug's whistle and three blasts to wish *Durbridge* a good passage, while sail was set and the voyage begun.

Ninety days at sea brought the deeply loaded ship around the Horn and into Table Bay, a remarkably good passage for the ship. With the discharging of grain taking a long time, *Durbridge* lay in Cape Town for nearly three months. And it was at this point in the career of the ship that her master died. Though not an old man, reckoned to be near the fifty-year mark, Captain McLauchlan passed away and was succeeded by his mate, Mr. Harry Wannell. Mr. Wannell had been in the ship for several voyages, and hailed from Topsham, Devon, where his father was on old Topsham pilot.

Captain Wannell finally put to sea from Cape Town on 11 December 1902 and sailed for Newcastle, New South Wales, for a cargo of coal, taking thirty-three days for the passage. The destination for this cargo was Iquique, on the dry coast of Chile. The high latitudes in the South Pacific Ocean knew many windjammers, for it was in the region of the Forties that the ships found the strong, fair winds to drive them along. Captain Wannell sailed from Newcastle on 23 February 1903, taking *Durbridge* down into the South Pacific during what would be that hemisphere's autumn season. Sixty days out he arrived in Iquique roads and anchored in the harbor to begin the discharge into lighters.

A period of three and a half months kept *Durbridge* anchored off the isolated coast of the Atacama, first at Iquique and then at Junin. If it weren't for the valuable and seemingly inexhaustible stores of natural nitrate there would be little else to attract a deepwater ship to that sparsely populated corner of the Pacific. Yet, around the turn of the century, the British controlled fifty-five per cent of the capital invested in the development of the nitrate industry, and many a Limejuice square-rigger could be seen anchored in the rolling, open roadsteads of what was widely known as the 'West Coast.'

Durbridge loaded a cargo of nitrate from lighters and sailed on 8 August for Hamburg. The homeward voyage took one hundred days. Her approach to the Elbe River was marred by grounding, and after the nitrate cargo was out of the ship she spent quite some time getting repaired.

Nearly three years had passed since *Durbridge* had been in home waters. During that time she had been around the world twice and had carried four cargoes. Such tramping was common enough. Captain Wannell stayed with the ship during her repairs in Hamburg and put her on the loading berth in that port, sailing on 13 January 1904 for San Francisco. There was a total of thirty-one on board in the crew, which had come from the boardinghouses of Hamburg.

February sailings into the North Atlantic were not new to Potters' big ship. Down through both Atlantics, around Cape Horn, and up through both Pacifics went *Durbridge,* arriving off the Golden Gate on 11 July after a longish passage of 149 days. A good part of the summer was spent in the Bay area discharging her outward cargo and awaiting a charter. Finally she was fixed for lumber, to load in the Columbia River, and cleared the Golden Gate on 15 October 1904. Within three weeks she was moored to a lumber mill berth and loading began.

By the last week of December she was loaded. Captain Wannell secured a crew from the boardinghouse masters in what was probably the toughest port on the Pacific coast at the time. The high-handed methods employed by the crimps and boardinghouse masters had often forced masters of foreign ships to protest to their consuls in Portland, but little came of it. Shipmasters' Associations were formed to resist the high rates of blood money charged for furnishing crews but in the long run they were ineffectual.

A week in Astoria provided enough time for the ship to be readied for sea and a crew rounded up from Portland and Astoria. On 4 January 1905 *Durbridge* was towed out over the Columbia River bar and sail was

set for the east coast of Africa. Her destination was Port Natal,[2] which was reached 108 days out, not a fast passage.

Toward the end of her discharging at Port Natal, a winter gale drove her aground. After some difficulty and a little delay she was floated and inspected. Whatever damage she might have sustained did not keep her from sailing, and within a couple of weeks of this mishap she was again at sea, bound for Astoria, Oregon.

Ninety-two days at sea brought her once more to the Columbia River lightship, arriving on 28 September 1905. She was taken in tow by one of the familiar stern-wheelers and taken to Portland and a loading berth. After loading grain, Captain Wannell took his charge to sea on 1 December 1905, bound for north Europe on his last voyage in the ship. *Durbridge* was 134 days on the homeward passage, arriving at Swansea, Wales, on 14 April 1906.

At the conclusion of this voyage, Captain Wannell left the ship and was succeeded by Captain A. C. Inglis. *Durbridge* was to remain under the Potter Brothers' house flag for at least three and a half years more, but Captain Inglis took her from Swansea and the coast of England for the last time under the British flag. The last four days of May saw the ship towing around through the busy Channel shipping to Antwerp to load a general cargo for San Francisco. She lay in the Belgian port all of June and most of July, finally getting away on 26 July.

A good many British shipowners were disposing of their sailing ships in favor of steamships about the time *Durbridge* loaded on this voyage for the west coast of North America. The appearance of a huge, subsidized fleet of sailing ships flying the tricolor of France on the face of the world's oceans a few years previously had dictated a lesson in economics to British shipowners. The result was the move to dispose of many sailing ships to foreign buyers, replacing them with larger steam tramps. Some of the finer ships went to Germany, a few came under American ownership by various means, but most went to the Scandinavian countries. With the exception of a few shipowners who were bold enough to order one or two last sailing ships from shipyards in Britain, the tramping trade was gradually being conceded to steamers.

Once again *Durbridge* worked out into the North Atlantic and shaped off for Cape Horn, but her passage round that southern headland to the Golden Gate was far from spectacular. One hundred and fifty-four days were spent on the passage, with arrival being made two days after Christmas 1906. Once her cargo of European hardwood, probably including

[2] Now more popularly known as Durban.

some steel and coke, had been discharged, the big ship anchored in some inactive corner of the Bay awaiting a charter—preferably on that coast.

Finally Grace & Company, the well-known business house with varied and wide interests in South America, chartered her to load a full cargo of lumber in Tacoma. Captain Inglis secured a crew and sailed from San Francisco on 16 March 1907. Within ten days he was reported in the Straits of Juan de Fuca and on 27 March was picked up by a watchful tug and towed to Port Townsend. Hind, Rolph and Company's ship *Henry Villard* was in port at the time, bound to the Tacoma mills for a cargo of lumber, so both ships were taken in tow by the tug *Tyee* and brought down the Sound. *Durbridge* went to a buoy in Commencement Bay and began discharging her San Francisco ballast, an operation that took her all of ten days to complete. Finally on 8 April she shifted in to the Tacoma Mill dock along with the four-mast bark *Muskoka* and began loading. Loading lumber was a slow operation at best in the Northwest. *Durbridge* was to be a familiar sight along the western shore of Commencement Bay.

If Captain Inglis didn't lose his crew to the Port Townsend boarding-house runners when inbound, it can be safely assumed that the Tacoma runners cleaned him out. The Tacoma Mill was only one of many very busy sawmills that clustered along the waterfront, and this one in particular was hard by the sailors' boardinghouse in Old Tacoma run by a big man named Billy Ryan. Ryan was an imported gentleman, whose qualifications for his calling as a boardinghouse master were said to have included a term as a fighter. The owner of the boardinghouse was one Dave Evans who also had more interests uptown in a hostelry known as the Donnelly Hotel. These two men were therefore comfortably established in the business of being hosts to visiting sailormen, and seeing that they were employed on outward-bound ships when the opportunity offered. And since Tacoma was one of the busiest ports on the Sound at the time, Messrs. Ryan and Evans maintained a lively trade in furnishing crews—not always including sailors—to departing ships.

Durbridge spent the balance of April, all of May and June and part of July loading and stowing a cargo of 2,000 M feet of lumber for Antofagasta and Iquique, Chile. As the last of the cargo was brought into sight and the ship nearing the end of her loading operation, Captain Inglis made the customary contract with the Evans boardinghouse master to provide him with a crew. In all good faith Captain Inglis began to get his ship ready for sea and noted that the semblance of a crew was delivered to the ship's decks.

The *Tacoma Daily Ledger,* which gave the Tacoma waterfront adequate and interesting coverage in its news columns, came up with a new development in its issue of 11 July 1907.

> Signed on for a voyage to the West Coast on the British ship *Durbridge* removed and signed for a voyage to the West Coast of South America on the American bark *St. James,* and a third time removed and placed in the county jail is the experience of Peter Thomas, Thomas Little and Charles Schmidt, who will appear this morning in the United States District Court for settlement of their entanglement.
>
> Meanwhile the peaceful calm of the local waterfront has been given a stir, and ripples of discomfort and disagreement have been circling among the captains of the two vessels and the local boarding master.
>
> A few days ago three sailors were signed on the *Durbridge,* procurred according to the contract by the local boarding master. It seems the captain of the vessel (Capt. Inglis) had given the boarding master a contract to secure the men, but before they were secured his owners ordered him to Port Townsend to complete crew. The boarding master objected to the removal of the men to Port Townsend and stated if the ship left port the men should be left behind. The master of the ship wrote a letter to the boarding master asking for written explanation, and stating that the men would be paid for after the crew had been secured at Port Townsend.
>
> Yesterday (10 July) the boarding master went to the ship and removed the men, as ground for his action claiming the ship's master had violated the contract. The American bark *St. James* needed sailors and had also a contract with the boarding master. The men were accordingly signed before the deputy shipping commissioner and taken on board the vessel.
>
> Securing a deputy United States Marshall, the captain of the *Durbridge* went to the bark *St. James* last evening and caused the arrest of the men on the charge of desertion. They were taken to the county jail. The master of the *St. James* objected to their removal on the ground that the men had been signed on the American vessel and were under the protection of the American flag. Upon threatened arrest from the marshall the master of the *St. James* allowed the men to leave the vessel.
>
> There was a rumor last night that the master of the *St. James* might be accused of conspiring to secure the seamen and be brought into court today but he claims to have known nothing of the circumstances of the case.
>
> The *Durbridge* was to have left for Port Townsend last evening and the *St. James* was to have departed for the West Coast this morning. Both have indefinitely cancelled orders for their tugs.

The following day the dispute was settled, with the Shipping Commissioner ordering the deputy United States Marshal to escort the trio of bartered seamen to *Durbridge.* They were reported to have been satisfied with the settlement of the dispute, and Captain Inglis announced his intention of securing a tug and shifting up the Sound to Port Townsend to secure the balance of his crew as planned. Captain Parker of *St. James* had shifted to Port Townsend and tidied up the last of his duties before clearing for sea. But there was a warrant out for his arrest, sworn to by

Captain Inglis of *Durbridge*, charging Captain Parker with conspiracy to steal his crew. The sailing of *St. James* was delayed while her master posted a bond and agreed to return to Tacoma for a hearing. It was rumored that a relief master would take *St. James* to sea, but Captain Parker declared for all to hear it would cause him no little trouble since he already had his family on board and the ship had been cleared at the Customhouse in Tacoma.

Things quieted down for a few days after that. Nothing more was heard concerning Captain Parker, and finally on 17 July *St. James* towed out through the straits and was gone—apparently with Captain Parker still in command.

Captain Inglis did not fare so well in getting his crew. But while waiting, as was the custom in those days, Captain Inglis was not at a loss for entertainment. Mrs. Inglis accompanied her husband on this voyage, and a few days after the *St. James* incident both she and Captain Inglis, along with Captain MacDonald of *Muskoka* and Captain Dalyrimple of the bark *Inveramsay* were guests of Acting British Vice-Consul Agassiz for dinner at the Tacoma Hotel. Next, a Captain Henry W. Campling died and his funeral was attended by most of the masters of other British ships in port.

July expired. On 2 August Captain Inglis secured the balance of his crew, which were delivered to the ship anchored about a half mile from shore. They were soon at work getting the rest of the gear in order for sailing, while Captain Inglis made his call at the Customhouse and cleared his ship for Antofagasta and Iquique.

On Sunday, 4 August, a Negro, J. Freeman, one of the newly acquired sailors, feeling somewhat apprehensive about the coming voyage, let himself down a line into the waters of the bay and began swimming ashore. Hardly had his shoulders felt the chill of the Sound, when he realized the water was too cold for any sustained swimming; but he swam around for about a half hour until his cries for help brought some aid and he was hauled out—back on board *Durbridge*.

'Dat water sho is cole,' he is quoted as saying, shivering, as he made his way forward to his recently deserted bunk to find some dry clothes.

On Monday morning, 5 August 1907, a tug came out for *Durbridge* and towed her toward open sea, clearing Tatoosh early the next day.

The passage to Antofagasta was prolonged due to a seriously damaged rudder and steering gear. All of 111 days were needed to bring her to the Chilean port and even then she spent the balance of the year and a good part of early 1908 in port. From the date of her arrival, 25 November

1907, until 16 April 1908, *Durbridge* lay in Antofagasta. Finally the repairs were effected, the cargo consigned to that port discharged and the ship shifted up the coast to Iquique. Whatever cargo remained for this second discharge was not long in being lightered ashore and a nitrate cargo loaded. On 11 May she hove up her anchors and sailed out of Iquique's roadstead, bound once more round the Horn to north Europe.

More trouble dogged the Potters' big ship when she was hit with some heavy weather approaching the Horn. Rather than continue on in her damaged condition, Captain Inglis returned to Valparaiso, which was reached sixty-one days out of Iquique. More time was lost; in fact, over two months were spent in Valparaiso before *Durbridge* was repaired and she cleared from that port on 15 September 1908. Over a year had passed since the ship had sailed from Tacoma; nearly ten months had been spent along the Chilean coast, or trying to get away from it.

It was a bedraggled *Durbridge* that towed up the Elbe River on 21 January 1909, 128 days from Valparaiso and 255 days from Iquique.

When the cargo was out, Potters' Hamburg agents were instructed to find a more or less permanent berth for their big ship and she was laid up. Her last voyage for her British owners had been completed, and whether or not they had actually decided then that her services were at an end, *Durbridge* did not carry the little sea-horse house flag of the Potter Brothers of London to sea again.

The year 1909 wore on. Certainly the German shipowners, under whose critical eyes she lay for those many months did not overlook her large size and carrying capacity. Maybe those big, deep, topgallant sails weren't so handy. Laeisz of Hamburg had yet to build the last of their Cape Horners, but they were buying some fine big ships and selling their smaller ones. No, apparently Laeisz didn't want her, though they had ample opportunity to look her over, there in Hamburg Harbor.

The Vinnens of Bremen were shipowners of some repute and operated an imposing fleet of big square-riggers, most of which had come from British yards. But the Vinnens didn't buy *Durbridge*.

Finally, the Hamburg firm of Knohr and Burchard arranged to buy her toward the end of 1909, and she was renamed *Steinbek*. She was the third vessel to carry that name to sea, her immediate predecessor being a 1,700-ton bark, formerly *Lodestar*.

Knohr and Burchard installed halyard winches and brace winches in their new ship, innovations that were finding favor amongst German shipowners in new ships then a-building, or on purchased ships from other owners. Though invented and introduced for practical use by

Captain Jarvis, a British shipmaster, the brace winch was not as readily accepted by the British in general as by the Germans. When properly used the halyard winches and brace winches reduced the work of handling a ship's yards by a considerable amount. But they could be dangerous too.

German sailing ships, like their sisters under the flags of other maritime nations, were, in those years just prior to World War I, chiefly engaged in the tramping trades carrying bulk cargoes. One of the last strongholds of German-owned windjammers was the nitrate trade from Chile to Europe, with occasional voyages from the Pacific Northwest with grain and lumber. In the dozen years prior to the war, Knohr and Burchard kept their fleet engaged for the most part in a series of voyages that took them from north Europe to Chile or the Gulf of California with coke, thence to the Pacific Northwest for grain or lumber. Or, after discharging the outward cargo they would be dispatched in ballast for Newcastle, New South Wales, for coal and return to Chile—then home with nitrate. This itinerary would permit just about one round voyage per year.

The new owners of *Steinbek*, ex-*Durbridge*, assigned Captain J. Koch as first master of their new acquisition. (Plate 2)

On Sunday, 6 January 1910, a tug came alongside the black-painted *Steinbek* and eased her out of her berth, through the congested shipping of Hamburg harbor and into the Elbe River. For three days she lay in the river, finally moving on down past Cuxhaven and towing into the North Sea. At noon of the thirteenth she left the island of Helgoland astern and set sail across the North Sea, looking for a fair wind through the narrow Dover Strait and into the English Channel. Five days later she passed Dungeness; on the nineteenth St. Catherine's Head was passed abeam at 5:40 P.M., while the ship felt her way along in the darkness of the long winter night. The Channel was safely negotiated and finally on the twenty-first the big full-rigger passed Lundy Island and was towed into Port Talbot, on the southern Welsh coast.

There she lay for over two weeks, while a full cargo of Welsh coal was poured through her hatches and trimmed. On 9 February the pilot and tug took *Steinbek* to sea as far as Lundy Island, where the sails were set and the voyage to Antofagasta, Chile, begun.

For only a day *Steinbek* wallowed in the Bristol Channel without a breeze and unable to maintain steerage way, but on the tenth a breeze found her and sent her farther off soundings and into the wider reaches of the North Atlantic.

Captain Koch kept two logs in his ship, as was the custom—one with weather data for the Deutsches Seewarte in Hamburg, the equivalent of the United States Navy's Hydrographic Office, and, of course, the regular ship's log. The account of the weather that struck *Steinbek* shortly after this is best described by the Old Man himself:

We left Port Talbot deeply loaded on the morning of 9 February 1910 with a strong West Nor'west wind. The pilot and tug left us at noon when Lundy Island was bearing south. During the forenoon we had a complete calm and till midnight of the 10th we were drifting without being able to steer the vessel. On the 10th and 11th we tacked against a hard West Southwest wind of force 7-9, Beaufort (scale). The high western seas were rolling over the forecastle. On 12th we had a light westerly breeze; on 13th a storm from South Southwest. At 4 PM the wind leapt to the Northwest in a heavy squall of hurricane force, till the following noon it slackened down gradually. Afterwards it veered to the Southwest and quickly increased to a full gale

(Note: From the smooth copy of the ship's log we find that the glass was dropping at a rapid rate all day on the thirteenth, starting shortly after midnight, where it stood at 30.03 inches, and dropping to 29.93 by 4 A.M.; at 8 A.M. it was 29.84; noon 29.57, and by 8 P.M. that night hit a low of 29.50.)

The following new sails were blown out of the boltropes: Inner jib, maintopmast staysail and foresail. Sheets tacks and halyards were all right but nothing broke. The ship was working terribly, the deck was always full of water from the forecastle to the poop. The mizzen royal backstays broke, the gale was raging for twenty-four hours, then it lessened and veered to the Northwest, blowing from this direction for twenty hours with a force 7-8 Beaufort. On the 17th again veering to Southwest and quickly increasing to hurricane force. A *new* mizzen topmast staysail was blown out of the boltropes. The bolt in the deck had been broken and the sheet tackle was hanging on the main topgallant yard. A breaker took the port boat with it. At 4 PM we furled the mizzen lower topsail. I was astonished that the other two topsails held the strain for the hurricane raged with full strength. On the following morning we found the fresh water in the starboard tank mixed with salt water whilst the port tank contained only 6'4", a nice surprise. The upper fastenings which had held the two tanks together were broken. Afterwards the tanks had moved so much that the pipe of the starboard tank had loosened the brass screw in the deck so that the sea water had a free entrance into the tank. I think that I do not make an overstatement of saying that we had always more than two hundred tons of water on deck between six and eleven PM. The vessel was lying dead, the lee yardarms of the lower yards sometimes touched the water. The hurricane gradually veered to southerly direction until the 21st. It was still blowing as a strong gale, lessening on the 22nd when it veered to the West. Until the 25th the wind blew from the West partly moderate and partly with gale force. On the 26th again a full hurricane, the fore lower topsail was blown away completely—chains, hooks and jackstays being broken.

A breaker swept the Third Mate Papske overboard. Fortunately I got him on board again by pulling him over the rail at the stern. The vessel was working horribly. The upper crosstrees broke. A breaker loosened the anchors, and all the bolts torn out of the deck. Between 27 February and 6th March the wind changed between South Souwest and North Nor'west, sometimes blowing moderate and sometimes with gale force.

I think these circumstances will excuse me for not having written this logbook from the beginning of the voyage. (Signed) J. Koch, Master.

Steinbek was battered, no doubt of that. But there was no sign of mortal damage to the hull and the hatches had held. That was most important. Despite the parting of the mizzen royal backstays, the rest of the heavy standing rigging held, so that the weary crew of *Steinbek* could not expect to put back. They kept on and came into the lower latitudes and finer weather.

Before leaving these waters and the approaches to the Channel, the following log extracts may be of interest, giving only the noon position and some weather data. The fluctuation of the barometer and accompanying wind changes on a near hourly basis for over a week provided anxious times for Captain Koch and his crew. Often *Steinbek* beat against southwesterly gales, losing distance and time.

Date	Time	Wind	Force Beaufort	Barometer	Position	Degrees Allowed Leeway	True Course	Day's Run[3]
9 Feb	Noon	Var	-	-	51-23N, 4-51W	-	-	-
10 Feb	Noon	SWxS	7	2987	51-37N, 6-40W	4	N80W	38
11 Feb	Noon	W x N	8	2986	50-54N, 6-30W	0	N8W	62
12 Feb	Noon	-	1-3	2994	50-25N, 7-03W	-	N17W	30
13 Feb	Noon	SSW	8	2957	50-15N, 9-08W	-	West	94
14 Feb	Noon	SW	3	-	48-48N, 10-19W	-	S18W	98
15 Feb	Noon	WNW	6-10	2923	49-00N, 10-12W	22	S6W	13
16 Feb	Noon	WSW	6-7	2959	46-56N, 10-38W	-	S19E	125
17 Feb	Noon	SW	7	2925	47-51N, 10-36W	33	N31W	84
18 Feb	Noon	SSW	5	2885	48-27N, 10-12W	22	S74E	41
19 Feb	Noon	WNW	11	2849	48-39N, 11-20W	45	S76E	47
20 Feb	Noon	WSW	11	2915	47-43N, 10-25W	22	S30E	67
21 Feb	Noon	SWxW	8-6	2938	46-26N, 9-15W	11	S30E	83
22 Feb	Noon	SW	4-5	2972	45-27N, 9-43W	1	N53W	60
23 Feb	Noon	West	6	2997	45-35N, 9-14W	11	S5W	42
24 Feb	Noon	W x S	5-3	-	45-38N, 9-43W	6	S	19
25 Feb	Noon	WSW	7-8	3000	45-39N, 10-16W	22	S17E	29
26 Feb	Noon	W	11	2965	46-34N, 10-32W	45	N34E	56
27 Feb	Noon	WNW	4-5	-	45-37N, 10-33W	22	S17E	59
28 Feb	Noon	NW	7-5	-	45-05N, 11-00W	-	S16W	53

[3] Figured from noon to noon, a sea day.

By the end of February *Steinbek* was out of the worst of it all and began cutting down her latitude. Captain Koch attempted to work his ship to the westward to cross the line in the vicinity of St. Paul rocks, near the twenty-eighth meridian. The farther west he went the better chance he would have of holding on to fair winds, since there would be a better chance to pick up the southeast trades with little lost time.

A month out, *Steinbek* picked up the northeast trades and settled down for some unspectacular but steady sailing. Fair winds sent her along her way, but only once, on 14 March, did she break the two-hundred-mile per day mark. Her day's run in the lower northern latitudes ran as follows, starting with 11 March: 157, 119, 165, 202, 139, 146, 110, 83, 75, 75, 99, 140, 161, 140, 148, 149, 76, 57, 57, this last being on 29 March, the day before she crossed the line. *Steinbek* was forty-nine days out when she crossed into the southern hemisphere in 26-07 west, a couple of hundred miles east of St. Paul rocks.

For a few days she wallowed, waiting for a breeze, but she didn't wait long. A series of squalls from the southwest bowled her along until the southeast trades picked her up and kept her moving toward the Brazilian coast. Off the coast of Patagonia a severe gale from the southwest battered the ship for a day or two but soon passed.

Captain Koch's intention was to pass through the Straits of Le Maire; his hope was for the wind to come from the north'ard, and indeed it did, until Staten Island came into sight. On 16 May *Steinbek* approached the straits with a northwest wind to help, but hardly had the ship squared away for the run through than the wind jumped into the west and then to the southwest. On the seventeenth Staten Island lay ahead, but Captain Koch felt his way around the eastern end and began the beat around Cape Horn.

Variable winds greeted *Steinbek*, but mostly from the southwest. Within a week Diego Ramirez was sighted, and it seemed as if the ship had a fair chance to get far enough west to clear the Cape Horn region. Then the wind backed to the northwest and drove the ship to the south'ard, and just as quickly veered into the southwest. Captain Koch tacked against these headwinds, going as far south as 58-50 before heading up north again. The glass dropped to twenty-nine inches, and then on 2 June to 28.25; and with ominous sign came hurricane winds from the direction just west of north. Better that than from the west. But it didn't last long enough for *Steinbek* to make the westing needed. The glass rose a little, the wind backed into the general direction from the southwest and *Steinbek* took advantage of the good chance to shy away from the Ant-

arctic waters. On 5 June she made one of her best day's runs of the voyage, 207 miles, but they were painful miles in the wrong direction. The work of two weeks was eaten up in twenty-four hours, and the soaked and frozen crew found themselves near their position of 22 May. Again the beat to the westward began, and another ten days brought her to 30 west. Here she had enough room to get shaped up into the Pacific, and Captain Koch soon began cutting across the latitudes into warmer waters.

On 20 June, with the wind from the south-sou'west, *Steinbek* crossed fifty south in the Pacific, taking thirty-five days to 'round the Horn,' that area lying south of the fiftieth parallels in both oceans. Again she found variable winds until she reached 35 south and then the southeast trades brought her to the approaches of Antofagasta, Chile.

At 11 A.M., 11 July 1910, *Steinbek* arrived off Antofagasta, 152 days out of Port Talbot, and anchored in the harbor. Captain Koch notified the consignees that his ship was ready to discharge, but it was six days before arrangements could be made to provide lighters to take off the coal. An average of three and a half lighters per day were loaded alongside *Steinbek* and towed to shore for discharging. With a swivel in her cables, *Steinbek* lay at anchor for over a month discharging the coal. July went, and August came, winter in the southern hemisphere. By 21 August the coal was out and the crew put to sweeping down and washing down the hold. This took two days, and on 23 August a string of lighters came alongside loaded to the gunwales with bagged nitrate.

To be continued

The Origin and Diffusion of Oculi: A Rejoinder

*BY CARROLL QUIGLEY**

MR. BOWEN was greatly agitated by my article in the July 1955 issue[1] criticizing his article in the January issue.[2] Numerous letters were exchanged without assuaging his agitation.[3] This culminated in his most recent article[4] which, to put it gently, is a most extraordinary melange of factual errors and interpretative misconceptions.

My July 1955 article was aimed at three topics: (1) Mr. Bowen's statements that the use of oculi originated with the Romans; (2) his further statements that this trait was taken to India by the Romans; and (3) his general misuse of historical evidence. In my article I did very little with the third point, simply seeking to show that there were alternative, and, on the whole, better interpretations of the evidence than the ones offered by Mr. Bowen. In the present article I shall devote more attention to this third point and shall feel free to make necessary comments on historical methodology.

In his letters last summer Mr. Bowen insisted (1) that he never said that the Romans 'invented' the oculus but rather that oculi had a 'Roman origin'; (2) that when he used the word 'origin' he did not mean originator but merely diffusor of the trait; (3) that when he spoke of 'Romans' he did not mean Latin speakers but Roman citizens, or, alternatively, people living in the 'Roman period' including Greeks.

* I wish to thank the Dumbarton Oaks Research Library of Harvard University for the use of its resources while writing this paper.

1 C. Quigley, 'Certain Considerations on the Origin and Diffusion of Oculi,' AMERICAN NEPTUNE, XV (1955), 191-198.

2 R. L. Bowen, Jr., 'Maritime Superstitions of the Arabs,' AMERICAN NEPTUNE, XV (1955), 5-48.

3 The chief letters were: (1) Bowen to Dodge on 11 August 1955; (2) Bowen to Dodge on 26 August; (3) Quigley to Dodge on 8 September; (4) Bowen to Quigley on 23 September; and (5) Quigley to Dodge on 10 October. It would be difficult to say how much my two letters, which were forwarded to Mr. Bowen, have influenced his 1957 article, but this article contains numerous paragraphs which seek, without reference to me or to my letters, to answer criticisms made in these letters. This is true, for example, of pp. 264, 278, 280, 282, and elsewhere.

4 R. L. Bowen, Jr., 'Origin and Diffusion of Oculi,' AMERICAN NEPTUNE, XVII (1957), 262-291.

In my answers to Mr. Bowen's letters I refuted these contentions by quoting from Mr. Bowen's article. It is true that Mr. Bowen does not use the word 'invent'; instead he says (in six places) that oculi have a 'Roman origin.' In one of these passages (quoted below) Mr. Bowen says that 'all such designs' have a Roman origin.[5] Such a statement must mean that all peoples who have oculi obtained them from the Romans and, accordingly, that the Romans had them before anyone else and must have been the originators of the trait and thus the inventors. The use of the word 'origin' to mean the *diffusor* rather than the *originator* would constitute a misuse of the word.[6] It is quite clear that when Mr. Bowen wrote his January 1955 article he (1) implied that the Romans originated (that is, invented) this trait and (2) used the word *Romans* to mean Latin-speaking persons and not to signify either citizenship or chronology. One significant passage reads as follows:

'Hornell argues for a Greek origin of the oculus found on the boats of Sicily and other places in the Mediterranean, and he suggests that many are the direct result of Greek colonists. I must disagree with this view strongly; a triangle is never shown on boats in Greek art, but we have several examples of it in Roman art. Hornell has failed to see the significance of the triangle occurring on the boats of both the West and the East. It is this triangle which shows the common Roman origin of all such designs. This design has been spread from England to China by the Roman Empire.'[7] This passage clearly distinguishes between Roman and Greek on what can only be a linguistic basis;[8] it claims a 'Roman origin' for the

[5] Use of the expression 'Roman origin' in Bowen, 'Maritime Superstitions,' pp. 20, 21, 22, 24 (two cases), and 36.

[6] Mr. Bowen's carelessness in his writing is almost unbelievable. Words like 'origin' or 'Roman' (both mentioned above) are used with vague or changeable or incorrect meanings. Even worse are numerous errors of fact, which I assume are also based on carelessness. Many examples of this will be given in this paper, but I'll mention a few others here: (1) Bowen ('Origin and Diffusion of Oculi,' p. 274 and n. 26) refers to a small, graceful, *oarless*, one-man, sailing craft illustrated in Moll as a 'galley,' which it surely is not; (2) in the same paragraph he refers to warships carved on what he calls 'a Roman relief of about 200 B.C.' although the relief in question (now in the Museo Archaeologico at Venice) is declared by the authorities who have examined it to be a Greek work, in Greek style, showing Greek ships; on this see, among others, C. Anti, *Il Regio Museo Archeologico nel Palazzo Reale di Venezia* (Rome: Libreria dello Stato, 1930), p. 140 ('di tipo e di stile greco. . . . I Greci delle navi sono stati sopresi da barbari). Mr. Bowen's carelessness is also evident in his self-contradictions. As one example, we might point out that, after telling us ('Maritime Superstitions,' p. 24) that the oculus was spread 'to China by the Roman Empire,' he tells us later (p. 45), 'It seems that the Chinese probably borrowed the eye from the Indians.'

[7] Bowen, 'Maritime Superstitions,' p. 24. I assume that the ambiguous word 'design' in this quotation refers to the use of oculi since this is the topic of the paragraph as shown in the first sentence of the quotation. If the word 'design' means the combination of oculus and triangle, my discussion is still valid; if, on the other hand, Mr. Bowen has changed the topic of his paragraph, so that the word 'design' means the use of the triangle alone, then his paragraph becomes meaningless and my discussion of it is beside the point.

[8] A similar distinction had been made earlier, on p. 19, in a passage quoted in n. 12 below.

trait everywhere; and it claims that this trait was diffused everywhere 'by' (does this mean *during*?) the Roman Empire. These claims, both for Roman origin and for Roman diffusion, are mistaken and are based on a series of factual errors which are assumed by Mr. Bowen to be true throughout his January 1955 article. Three of these errors are as follows: (1) It is not true that oculi do not occur with triangles on Greek boats[9] and, accordingly, any inferences based on an assumed distinction between Greek and Roman boats in this respect is mistaken. (2) It is a mistake to argue about a Greek or Roman origin for oculi in 'Sicily and *other places in the Mediterranean*' because, as I shall show below, this trait is older than either the Greeks or Romans all through the Mediterranean, since it was used on Egyptian, Cretan, Canaanite, Phoenician, Carthaginian, and Etruscan vessels before we can safely speak of Greek, or still less, of Roman boats. (3) It is an error to state that 'this design has been spread from England to China by the Roman Empire' because it was spread, at least to England and possibly to China long before there was any Roman Empire or even any Romans.[10]

In my 1955 article I sought to refute Mr. Bowen's claim for 'a Roman origin' for this trait 'everywhere' by giving references to show that the Egyptians had oculi long before the Romans.[11] In his 1957 article (p. 262), Mr. Bowen concedes that the Romans did not invent the oculus but feels

[9] Oculi enclosed in triangular areas on Greek vessels earlier than the Roman period will be found, for example, on pottery dated before 500 B.C.; there is a much-published example in the British Museum: see British Museum. Department of Greek and Roman Antiquities, *A Guide to the Exhibition Illustrating Greek and Roman Life* (second edition, London: British Museum, 1920), pp. 34-35. The fact that the Greeks, the Egyptians (as Mr. Bowen recognized in his first article, p. 19), and the Etruscans (as Mr. Bowen recognizes in his second article, p. 275, fig. 4) used triangles before the Romans did so makes mincemeat of his efforts to use this as an argument that the Romans took oculi to India. It is worth noting that in his second article (p. 274) he admits that the Greeks had colored patches on the ends of their boats, some of them triangular, and that these occur both with and without oculi. Thus in this second article Mr. Bowen abandons the chief argument offered in his first article as evidence that the Romans took oculi to India (namely that both Romans and Indians placed oculi on colored patches, frequently colored red).

[10] The diffusion of the oculus to northwestern Europe took place considerably before 1000 B.C. Oculi and geometric disks are found on a Bronze-Age ship depicted on the Caergwle bowl mentioned by T. C. Lethbridge, *Boats and Boatmen* (London: Thames and Hudson, 1952), pp. 76 and 123. An oculus on a Scandinavian petroglyph of a boat of the pre-Bronze (that is, Stone) Age, surely older than 1000 B.C., is pictured and mentioned in A. W. Brögger and H. Shetelig, *The Viking Ships: their Ancestry and Evolution* (Oslo: Dreyers Forlag, 1951), p. 17, fig. 20, and p. 19. There are numerous geometric oculi, usually identified as sun disks or solar symbols in, on, or near ships depicted in megalithic rock carvings of western Europe and Scandinavia. See many such designs in M. Péquart and Z. Le Rouzic, *Corpus des Signes gravés des Monuments Megalithiques de Morbihan* (Paris: A. Picard, 1927), *passim*. Scandinavian examples are shown in F. Moll, *Das Schiff in der bildenden Kunst* (Bonn: Kurt Schröder Verlag, 1929), plates D Ia and D Ib.

[11] I picked this case because it was not clear, from the confusion of Mr. Bowen's writing, that he knew that the Egyptians had oculi. One reference to this people (p. 19) refers only to triangular patches on boats, while a later statement (p. 35) is so confused that it is not possible to separate into three parts what Hornell believed, what Bowen believed, or what the Egyptians had. The third reference to the Egyptians (p. 30) refers to 'these superstitions' without indication what the word *these* has reference to.

that the Egyptians did. This is certainly an advance, but, as I shall show later, the oculus is not an Egyptian invention either.

On the second point, that the Romans (that is, Latin-speaking persons) took the oculus to India, Mr. Bowen was emphatic in his 1955 article. First he argued that the Romans, rather than the Greeks, must have introduced into the Indian Ocean the practice of decorating the ends of boats with painted triangles on the mistaken grounds that this practice was not known among the Greeks.[12] Then he leaped, through two non sequiturs, to the claim (p. 20), 'that the oculus cult in the western Indian Ocean was started by Roman colonists in India in the first and second centuries A.D.' The two non sequiturs are (1) that findings of Roman coins in India indicate that there must have been Roman colonies there and (2) if there were Roman colonies in India, there must have been either Roman ships or Roman shipbuilders to introduce the oculus. I shall show in a moment that these are not only non sequiturs but are contrary to the historical evidence.[13]

In his efforts to make these non sequiturs seem reasonable, Mr. Bowen tries to refute my statement that the Romans were not a maritime people and, hence, unlikely to invent or diffuse items of ship construction.[14] To

[12] The full passage (Bowen, 'Maritime Superstitions,' p. 19) reads, 'Since it was customary to decorate both ends of ancient Egyptian funeral barges with somewhat similar triangular areas [he means similar to Roman ones just discussed], it seems that the idea of decorating the ends of boats undoubtedly originted in Egypt. Apparently the Greeks did not decorate the ends of their boats in such a manner, although they did use oculi on the bows of their vessels. Since we know that the Romans did decorate the ends of their boats, it is logical to suppose that they are responsible for the introduction of this practice into the Indian Ocean.' Here, as I shall show later, Mr. Bowen avoids the obvious inference that the Indian Ocean's oculi and triangles came from Egypt, which had both long before the Romans, especially as the Egyptians did sail out of the Red Sea which the Romans did not.

[13] In 'Origin and Diffusion,' p. 262, Mr. Bowen makes a partial concession by rewording his claim to read that the oculus was taken to India 'in Roman times' rather than 'by the Romans,' but this concession is immediately retracted, for he devotes the next twenty-three paragraphs to an effort to show that the Romans did take the oculus to India, themselves.

[14] Mr. Bowen states ('Origin and Diffusion,' p. 269) that the absence of a Roman fighting fleet from the Red Sea and the Indian Ocean does not prove that there was no Roman merchant fleet in those areas. This is correct, but, in combination with my other evidence, it should indicate Rome's lack of concern with sea power. The absence of a fleet from the Red Sea and the inadequacy of the fleet in the Mediterranean Sea, along with the prevalence of piracy in both seas, supports my argument, but Mr. Bowen, with his usual proclivity for reversing the facts to fit his theories, says (p. 261) that 'this danger was no worse in the Red Sea than it was at times in the Mediterranean' and infers from this that there was no need for a naval force in the Red Sea. The chief authority on this subject, Omerod, is in sharp disagreement with Mr. Bowen: he wrote, in reference to the same period and same area, 'it is the more remarkable that the imperial government should have paid so little attention to what was happening in the outer seas. The Red Sea was infested by Arab pirates, who preyed upon the shipping which followed the trade-route from Myoshormos to India. . . . Attacks from Arab pirates were the more dreaded owing to their use of poisoned arrows.' H. A. Omerod, *Piracy in the Ancient World* (Liverpool: University Press, 1924), pp. 257-258. See also C. G. Starr, Jr., *The Roman Imperial Navy, 31 B.C.–A.D. 324* (Ithaca: Cornell University Press, 1941), *passim* (see index under 'piracy'), especially p. 171; J. H. Thiel, *Studies on the History of Roman Sea Power in Republican Times* (Amsterdam: North Holland Publishing Company, 1946), *passim* (see index under 'piracy').

support my argument I gave references to writers like Tarn, Hatzfeld, Thiel, and Parvan, who spent years studying Roman experience on the sea. I also argued that a people who would allow their fighting navy to fall into alien hands would be very unlikely to retain their merchant navy and, in general, would be too lacking in seagoing qualities to be regarded as either the inventors or diffusors of details of marine construction. Mr. Bowen ignored my authorities and rejected my inferences regarding the landlubberly qualities of the Romans. I can hardly expect that Mr. Bowen will give a readier welcome to any additional references on this point, but, in the hope that other readers might be more open-minded, I shall add a few, very weighty, authorities here. Tenney Frank, our greatest authority on Roman economic history, speaks of 'bankers, manufacturers, and shippers' being non-Romans under the Republic; later, of the Imperial period, he says,[15] 'these occupations were more than ever tabu to respectable Romans'; of shippers he says, 'most of them were foreigners or ex-slaves.' If a Roman merchant fleet existed anywhere, we could expect to find it in Ostia, the port of Rome itself, but, speaking of this harbor, Professor Frank wrote,[16] 'It is certain that most of the imports were carried by . . . citizens of the exporting cities in Asia, Syria, Egypt, Africa, Spain, and elsewhere.' It was so difficult to get Roman citizens to ship out of Ostia, even in the essential grain trade from Egypt, that the Emperor Claudius (A.D. 41-54) issued an edict granting citizenship to foreigners who carried tribute grain to Ostia for six years. If this was true of the port of Rome, how likely is it that we could find Latin-speaking Romans, or even non-Latin Roman citizens shipping from the ports of India?

The lack of seagoing qualities among the Romans is a truth which Mr. Bowen refuses to accept. He returns to the subject repeatedly[17] offering increasingly fantastic arguments to support his untenable position. At the same time he refuses to see the significance of facts with which he is well acquainted. The fact that the seagoing terminology of the Roman Imperial period is not Latin but alien[18] is ignored by Mr. Bowen. He is aware that the annual religious ceremony which opened the navigation season was called by the Greek name *ploiaphesia*[19] and was in honor of the

[15] T. Frank, et al., *An Economic Survey of Ancient Rome* (6 vols., Baltimore: Johns Hopkins Press, 1933-1940), V, 28.

[16] Frank, op. cit., p. 242; similar statements on pp. 217, 271, 273, etc.

[17] Bowen, 'Origin and Diffusion of Oculi,' pp. 271-272.

[18] E. de Saint-Denis, *Le vocabulaire des manoeuvres nautiques en Latin* (Macon: Protat Frères, 1935). On this point, see the quotations from Starr in n. 23 and 24 below.

[19] R. Graves, *The Golden Ass of Apuleius* (New York: Pocket Books, 1951), pp. 237-250, especially p. 247; T. C. Lethbridge, op. cit., p. 70.

Egyptian goddess Isis, yet he refuses to see the significance of these facts. Although he is aware that Isis is an Egyptian deity, he constantly assumes or implies that it is Roman or Greek,[20] and from this false assumption tries to imply that maritime traits associated with Isis are Roman instead of drawing the correct inference that anything associated with Isis is probably non-Roman since Isis is not a Roman deity.

As Mr. Bowen accumulates arguments to demonstrate the seagoing qualities of the Romans, they become increasingly untenable. He states (p. 272) that, 'by the first and second centuries A.D. Latin-speaking Romans had learned to sail their own merchant vessels.' He offers as evidence a ship painting from Ostia in which the human figures are labeled with names with Latin endings. Even if these labels were really Roman names in the usual trinomial form (which they are not), this would not controvert the evidence of Frank, Rostovtseff, or Hatzfeld that ships and shippers out of Ostia were invariably non-Roman and non-Latin. In fact, several modern writers have covered this very point, showing that alien sailors (and other aliens) adopted Latin names to the point where laws had to be made to forbid this. Professor Frank points out[21] that some sailors obtained this right through the edict of Claudius already mentioned, an edict which sought to encourage aliens to engage in a seafaring activity which citizens refused to perform. Mr. Bowen seems to be unaware of the evidence that the possession of Latinized names is perfectly compatible with alien origin, especially among sailors, soldiers, and merchants in the Imperial period. This evidence, derived from tombstones and other inscriptions, shows that aliens in Roman service generally took Roman names, even the trinomial, and did so, at times, when their ignorance of the Latin language did not permit them or their associates to write the language correctly on the tombstone.[22]

[20] At Bowen, 'Origin and Diffusion,' p. 285, he goes so far as to offer (as one of 'Two new bits of evidence . . . that the Arabs copied the colored patch and oculus directly from ships of the familiar Roman type') the fact that a statue of Isis was recently found 'in South Arabia.' Then he adds, 'Besides Isis, it appears that other Greek gods or goddesses may have found their way into ancient South Arabia.' Writing of this kind is an insult to scholarship for at least three reasons: (1) the use of the word 'other' implies that Isis is a Greek deity; (2) the fact that Isis, as an Egyptian deity, was known to South Arabians centuries earlier than the Romans or Greeks is ignored; (3) the fact that this statue in south Arabia is not in a maritime context at all does not prevent Mr. Bowen from offering this discovery, as evidence that Roman ships brought oculi to South Arabia. Later Mr. Bowen tries to strengthen this evidence with the additional irrelevancy that this particular statue 'is done in Hellenistic style.' Thus an Egyptian goddess done in a Greek style is offered as evidence that Arabs adopted a ship decoration from the Romans!

[21] 'Nearly all these men [Syrian and Greek shippers] bear the *nomen* of a citizen; hence those who were not already citizens may have gained the franchise by the operation of the Claudian edict mentioned above.' T. Frank, op. cit., V, 271. On the use of Latinized names, frequently incorrectly, by Greek and other non-Latin seamen, see J. Hatzfeld, *Les Trafiquants Italiens dans l'Orient Hellénique* (Paris: E. de Boccard, 1919), pp. 8-16, and the reference to Starr in n. 22.

[22] The customary reference on this point is in Parvan, *Die Nationalität der Kaufleute im*

In the fighting navy, where I still insist (in spite of Mr. Bowen) that the Roman influence was larger than it was in the mercantile marine, the terminology, ships, and ranks were Greek[23] (and become more so rather than less in the Imperial period),[24] the crews were Greek, Syrian, African, and even Egyptian, while the officers, including ships' captains and squadron commodores, were of the same origins (generally risen from the ranks), and the highest levels, equivalent to admiral, were available to ex-slaves of the emperor for lack of Romans.[25]

In addition to his efforts to use faulty evidence to combat my attribution of non-seafaring qualities to the Romans, Mr. Bowen also seeks to quote authority. Unfortunately the 'authority' which he quotes is not one to which any work of respectable scholarship should appeal. The work in question, T. C. Lethbridge's *Boats and Boatmen*, is interesting and even charming, but it cannot be quoted as authority because it is completely undocumented (with no footnotes, citations, or bibliography) and provides a quite unorthodox interpretation of the evidence on the very point on which Mr. Bowen quotes it as an authority. In addition, the quotation which Mr. Bowen uses is not only badly torn from its context, but is a hypothetical double-negative sentence. When this sentence is put back into the context from which Mr. Bowen extracted it, the whole passage has a meaning almost the reverse of that which Mr. Bowen implied. In his version of this passage Mr. Bowen gave two sentences; let me repeat these, adding (in italics) the following three sentences as well and see how this context changes the meaning of the passage as implied by Mr. Bowen's curtailed version:[26]

> By a curious twist of fate, it was a race of farmers who did more to extend the ideas of European boat-building than any other people of antiquity. It would be, no doubt, quite incorrect to suppose that there were no ancient Roman merchantmen

Römischen Kaiserreich (Breslau, 1909), pp. 39-42. That Latin names do not indicate Latin origin or speech is perfectly clear to Starr who says (op. cit., p. 72), 'when one comes to examine these Latin-named sailors no real indication of Latin status is visible. . . . The tendency, indeed, of non-Roman inhabitants of the empire to use names based on Roman forms was checked by Claudius, who forbade peregrines to usurp "Romana nomina dumtaxat gentilicia." ' A table giving the geographical origin of all sailors of the Roman fighting navy, where this is known, shows that only 13 out of 317 were of Italian origin. And, clearly, the merchant marine was even less Italian than the fighting navy.

[23] 'In the inscriptions, indeed, one finds only the Greek titles *trieres, quadrieres, penteres*. . . . The Latin equivalents, triremis and so on, never appear.' C. G. Starr, Jr., op. cit., p. 52 and n. 6.

[24] Starr, op. cit., p. 55, says, 'Recruitment of Hellenized sailors had become so great in the first century before Christ that when Augustus gave the Roman imperial fleet its definitive form, Greek experience was incorporated inextricably into the naval fabric, more so even than in the fleets of the earlier Republic. The Romans adopted the Greek titles for ship's officers, and along with the titles, presumably, the relative rank of the posts, which had long been fixed in Greek waters.'

[25] Starr, op. cit., p. 32.

[26] Lethbridge, op. cit., p. 133.

or fishing-boats before the Punic Wars. *The Romans, however, were not a seafaring people. It happened though that . . . the Roman Empire eventually came to include all the seafaring peoples of Europe and North Africa, except those of the Baltic and Scandinavia. Ships, carrying objects of Roman manufacture sailed as far as India and Iceland.*

It is quite clear from the full version that Lethbridge did not mean that Latin-speaking Roman farmers spread their own boatbuilding techniques but rather that this 'race of farmers,' *even if we assume* that they had their own boats before the Punic Wars, 'were not a seafaring people,' but supplied the political unity within which other seafaring people spread 'ideas of European boat-building.' It should be noted that Lethbridge's emphasis on the importance of the Romans as an instrument for spreading 'ideas of European boat-building' is based upon one chief point on which he is almost certainly incorrect. This is the belief that the keel method of construction came to northwestern Europe in the Roman Imperial period. According to Lethbridge, the wooden boat of northwestern Europe before the Roman period (say 60 B.C.) was a long-ship of dugout construction and the Romans brought north as an innovation both the keel method of construction and the round, merchant vessel. Lethbridge himself calls this idea 'shocking heresy.'[27] It is almost certainly untenable heresy, not only because Caesar specifically states[28] that the Veneti vessels, when he first found them, had keels 'somewhat flatter than those of our ships,' but the Scandinavian petroglyphs, sketchy as they are, seem to indicate the use of projecting keels. Lethbridge's efforts to interpret the vessels of the Scandinavian petroglyphs as dugout canoes whose sides have been raised by sewn strakes is made singularly unconvincing by his effort to present the ram-carrying war galleys of Assyrian Tyre (about 700 B.C.) as the same type of dugout with sewn strakes. The inherent improbability of Lethbridge's reconstruction of the Assyrian vessel makes his unorthodox reconstruction of the Scandinavian petroglyph less persuasive. As a dugout carrying such a large number of rowers at such a great height above the waterline, the Assyrian vessel would have been too unstable to maneuver, while combat by ramming with such a vessel would be impossible; moreover it would be highly unlikely that Assyrian Tyre, in full Iron Age, would have used sewn strakes or, with its elaborate woodworking tools (including plank-cutting saws), would have used a dugout hull. From this point of view Lethbridge's reconstruction of both the Assyrian vessel and the Scandinavian petroglyph fall to the ground, and,

[27] Ibid., pp. 14 (keel), 93-98 (round-ship), and 147 ('shocking heresy').

[28] Caesar, *De Bello Gallico*, III, 13.

in the light of Caesar's comment on Veneti ships, Lethbridge's efforts to make the Romans the diffusors of the keel in northwestern Europe fall to the ground also. There may be some justification in writing an undocumented popular book incorporating 'shocking heresy' as Lethbridge has done; I see no justification in tearing from context a couple of sentences from such a book when the first sentence is based on the 'shocking heresy' itself, the second sentence is pure supposition, and the next sentence (which is omitted) reverses the implied meaning of the two quoted sentences. I should like particularly to point out that Mr. Bowen's specific purpose in extracting this two-sentence quotation was to use as evidence Lethbridge's purely hypothetical second sentence. This unscholarly practice of trying to demonstrate fact by inference from supposition is a regular practice with Mr. Bowen (other examples include the hypothetical Roman embassies to India or the case of the artemon, both discussed below).

Turning from the question of the Romans as 'originators' of the oculus and as seafaring people, we must consider Mr. Bowen's contention that the Romans took the oculus to India. Among other untenable ideas, he tries to argue that the *Yavana* in India could have included Latin speakers and gets into a disingenuous discussion (pp. 263-264) seeking to show that Sir Mortimer Wheeler said as much. Later (on p. 266) he refers to this inconclusive, disingenuous, and completely erroneous discussion as evidence that Sir Mortimer believes that Latin-speaking Romans were in India. This later passage reads, 'I believe that many more authorities can be found who believe that Latin-speaking Romans visited India than who doubt the fact. We have seen above there is no question in the mind of Sir Mortimer Wheeler that at least a few Romans visited India.' I shall now show (1) that the word *Yavana* was not used to include Latin-speaking Romans; (2) that the overwhelming preponderance of authorities deny that goods were carried to India in Roman ships; (3) that Sir Mortimer Wheeler has a very large question in his mind about the presence of Latin speakers in India; (4) that other authorities have an even larger question in their minds, since the evidence used by Mr. Bowen to imply the presence of Latin-speaking Romans or even Roman citizens implies no such thing. Before I go on to these points I should like to point out that Mr. Bowen, in this argument, falls once again into a non sequitur by assuming that the presence of a few Latin-speaking tourists in India could be used as evidence that Romans brought the oculus trait to India. In order to prove this last point Mr. Bowen must find more than a few tourists;

he must find Roman ships or Roman shipbuilders in Indian harbors. In view of the scarcity of Roman ships or Roman shipbuilders in the Mediterranean or even Ostia, this will not be easy.

Mr. Bowen's frequent use of non sequiturs arises from his refusal to distinguish between evidence for four different conditions: a. Roman coins in India; b. Roman goods in India; c. Roman 'colonists' in India; d. Roman ships or shipbuilders in India. Although the diffusion of the oculus to India by 'Romans' requires evidence of class d, Mr. Bowen constantly uses evidence of types a, b, and c on the unstated assumption that existence of these would imply existence of type d. Not only is this a non sequitur, but the evidence shows that it is a contrary-to-fact non sequitur. Mr. Bowen assumes (tacitly, of course) that finds of Roman coins in India imply the other three types of evidence (especially type d). Not only does it imply no such thing (after all, Roman coins have been found in many places, such as tropical Africa or America, where Romans never went), but Mr. Bowen is familiar with evidence which shows that it cannot be so implied. Sir Mortimer Wheeler, whom Mr. Bowen quotes incorrectly as an authority in support of evidence of type c, has discussed, with maps, the finds of Roman coins in India. His conclusion is that these coins were not used for exchange in everyday commercial transactions, but were stored in hoards as bullion by natives (and frequently were defaced so that they could not be used as coins). This effectively disposes of any attempt by Mr. Bowen to use evidence of type a to imply evidence of type c or d.[29]

A similar non sequitur is used with reference to finds of Roman commercial products in India. From the discovery of a dozen sherds of Arrentine pottery along with some other materials of Mediterranean origin at Arikamedu, Mr. Bowen tries to infer the existence of an ancient 'Indo-Roman trading station' with Latin-speaking Romans. The evidence refutes this inference since, associated with the Arrentine sherds, were fragments of inscriptions written, unfortunately for Mr. Bowen, not in Latin but in Tamil.[30] Thus the Roman colonists at Arikamedu evaporate. Nevertheless, Mr. Bowen tries to use Sir Mortimer Wheeler as authority for the fact that they were there. As one of the original excavators of these archaeological remains, Sir Mortimer, like many excavators in the first

[29] Mr. Bowen tries to do this in both of his articles; see Bowen, 'Maritime Superstitions,' pp. 19-20, and Bowen, 'Origin and Diffusion of Oculi,' p. 266. On the real significance of these coin finds, see Sir Mortimer Wheeler, *Rome Beyond the Imperial Frontiers* (Harmondsworth: Penguin Books, 1954), pp. 164-172.

[30] The inscriptions are mostly in Tamil with some in Middle Indo-Aryan, both written in Brahmi script. See J. Filliozat, 'Les Échanges de l'Inde et de l'Empire Romain aux Premiers Siècles de l'Ère Chrétienne,' *Revue Historique*, CCI (1949), 1-29, at 19.

flush of enthusiasm for their findings, made some rather extravagant claims for the evidence he had found, including the claim that Roman colonists *might have lived* at this site.[31] This claim was soon shown to be unsupported by the evidence, and Sir Mortimer quietly abandoned it. It is worthy of note that Sir Mortimer makes no such claim in the book which Mr. Bowen quotes to this effect.[32] It is a typical example of Mr. Bowen's usual carelessness with words that the passage which Mr. Bowen quotes from Sir Mortimer makes no such claim as Mr. Bowen seems to believe it does. In this passage we find a definite statement which refutes Mr. Bowen, followed by a hypothetical clause which does not support him: 'The Yavana sailors must mostly have been Egyptian Greeks and Arabs, but we may suppose that here and there a more or less resident freedman represented the interests of a master sitting afar off in one of the shipping offices of Alexandria or Ostia, Myos Hormos or Berenice.' In three of these cities the 'master' would almost certainly not be a Roman and, as we have seen above, the chances of this would be very slim in Ostia as well. And the chances of the 'freedman' resident in India being a Roman would be nil; a freedman, as an ex-slave and thus, a war captive or a descendant of war captives, would not be a Roman at all. He is merely the 'ex-slave' non-Roman mentioned by Tenney Frank above. But notice what Mr. Bowen does with this quotation. From this hypothetical non-Roman ex-slave he concludes that 'there is no question in the mind of Sir Mortimer Wheeler that at least a few Romans visited India.' And from these supposititious Roman tourists inferred from some hypothetical non-Roman ex-slaves Mr. Bowen draws the inference that Roman ships brought oculi to India!

Mr. Bowen's performance in regard to the word Yavana is just as fantastic as his behavior with the 'Roman colonists.' Once again he ignores the authority quoted by me on the meaning of the word and goes off at considerable lengths on the fact that Yavanas were not all Greek speaking. Of course they were not; no one has claimed that they were; probably most of them were native Indians, subjects of Greek or Macedonian kingdoms in northwestern India.[33] The point at issue is whether the Yavanas

[31] R. E. (now Sir) M. Wheeler, A. Ghosh, and K. Deva, 'Arikamedu: an Indo-Roman Trading Station on the East Coast of India,' *Ancient India*, No. 2 (1946), 17-124. Filliozat's paper mentioned in the preceding note was chiefly written to refute the suggestion about Roman colonists made in this article.

[32] Bowen, 'Origin and Diffusion of Oculi,' p. 266.

[33] Tarn has shown that of nine persons who called themselves Yavanas (or, in one case, Yonaka) in cave inscriptions near Bombay, all were Indians and, accordingly, the term applied to citizens of Greek states in Asia. See W. W. Tarn, *The Greeks in Bactria and India* (Cambridge: University Press, 1951), pp. 254-258; also D. C. Sircar, 'The Yavanas,' in R. C. Majumdar, ed., *The History and*

ever were Latin-speaking Romans. Although numerous persons have discussed the meaning of this word (many of them much more 'thoroughly' than Sir Mortimer Wheeler), none, so far as I know (and this includes Sir Mortimer), has suggested that the Yavanas were Romans.[34] Yet Mr. Bowen, by twisting both logic and phrascology, tries to pretend that this is a likely possibility.[35]

Logic also comes out second best in Mr. Bowen's consideration of the question of hypothetical Roman embassies to India. Because there is Chinese evidence that Roman embassies came to China by land, Mr. Bowen tries to argue that Roman embassies must have come to India by sea. This is a false analogy, especially in view of the Latin evidence of Roman reluctance to return the numerous Indian visits.[36] Moreover, even if we could prove one or several Roman embassies to India, could we believe that these ambassadors took the oculus to India, either by traveling in Roman ships (which were nonexistent in the Indian Ocean) or by building Roman ships when they arrived (a highly unlikely way for an ambassador to spend his time on a brief visit)?

At one point in his discussion (p. 264), Mr. Bowen shifts his argument. He briefly abandons his contention that Roman ships were in the Indian Ocean and replaces it with the contention that Greek-speaking Roman subjects were there. As he puts it, 'to be technically correct one should read "Roman subjects" in all instances where I have referred to "Romans" in the Indian Ocean.' But if we concede that Greeks took the oculus to India, what is to prevent them from doing this at any time back to the day in 325 B.C. when a Greek fleet first appeared in Indian waters under

Culture of the Indian People: the Age of Imperial Unity (Bombay: Bharatiya Vidya Bhavan; second edition, 1953), pp. 101-119. On the first page of this section (p. 101), the word 'Yavana' is defined with the notation 'as late as the early centuries of the Christian era it meant, to an Indian, the Greeks only.' Note that this is the very period in which Mr. Bowen tries to give the word a different meaning.

[34] The chief discussions of the meaning of the word 'Yavana' are S. Lévi, *Quid de Graecis Veterum Indorum Monumenta tradiderint* (Paris: E. Bouillon, 1890); P. Meile, 'Les Yavanas dans l'Inde Tamoule,' *Journal Asiatique*, CCXXXII (1940), 85-123; various comments by E. H. Johnston in *Journal of the Royal Asiatic Society for 1939*, pp. 217-240, and by O. Stein in *Indian Culture*, I (1934), 343-357; and the references cited in n. 33 above.

[35] Logic is twisted by shifting the discussion from the question whether 'Yavana' included Romans to the question whether 'Yavana' included any non-Greeks. Phrascology is twisted when he speaks of Sir Mortimer Wheeler's cursory mention of this problem as having 'considered this problem very thoroughly.'

[36] The usual reference is E. H. Warmington, *The Commerce Between the Roman Empire and India* (Cambridge: University Press, 1928), pp. 35-38. This authority finds no evidence of return embassies to India from Rome; in fact, his conclusions on Roman-Indian relations are totally opposed to those of Mr. Bowen, for he says (p. 38), 'the visits of these [Indian] embassies were some of the few occasions on which true Romans and Indians met each other face to face, for Greeks, Syrians, Jews, and Arabs did most of the trading. . . . True Romans visited Egypt not often, Arabia and the Euphrates seldom, the Caspian and India *never*' (my italics).

Nearchus? And if the Greeks had the oculus in India three centuries before the Roman Empire, what becomes of Mr. Bowen's statement that Roman subjects took the oculus to India? Are Nearchus and Alexander the Great or any of Alexander's successors in India 'Roman subjects'? And if we could demonstrate that the Greeks took the oculus to India, would not this make a shambles of Mr. Bowen's original article where he made an argument (based on triangular patches on boats) that it was not the Greeks but the Romans who took the oculus with triangle to India? Mr. Bowen sees this last point, so in his next paragraph (p. 264) he tries to save his first article by arguing that the contrast between Greeks and Romans in that article was a chronological contrast (which it clearly was not) so that, apparently, Romans are called Greeks in the earlier period and Greeks are called Romans in the later period. Having strained our credulity with this, Mr. Bowen has worked in vain, for, without having saved his first article, he has now put a torpedo into the second. For if Greeks brought the oculus to India and Greek has a chronological (earlier) meaning, what becomes of Mr. Bowen's contention (on p. 262) that the oculus came to India in the Roman (later) period. Thoroughly confused, and confusing, at this point in his article Mr. Bowen confesses (p. 264) that 'such terms as "Greeks and Romans" and "Greek art" are admittedly ambiguous and often confusing. . . .' He should recognize that he is the one who is confused and that most of the rest of us know what we mean when we speak of Romans or Greeks.

From this confusion Mr. Bowen emerges by returning once more to his original idea that Latin-speaking persons took the oculus to India. He begins (p. 266) with the untrue statement that 'many more authorities can be found who believe that Latin-speaking Romans visited India than who doubt the fact.' Of course this is nonsense, but Mr. Bowen tries to prove his point by showing that Sir Mortimer Wheeler thinks so. I have already shown that Sir Mortimer no longer is willing to defend this belief. In my earlier article (p. 193) I showed that J. O. Thomson did not believe it and that, while M. P. Charlesworth believed that 'Romans' reached India he does not use the word to mean Latin-speaking persons and does not believe that Roman ships were used (which does not help the oculus). The greatest French authority on this subject, J. Filliozat, does not believe it; in fact, he is one of the authorities who forced Sir Mortimer Wheeler to abandon his original overenthusiasm on this subject.[37] As a preliminary to his enormous projected study of Chinese sci-

[37] J. Filliozat, op. cit.; at p. 12 we read, 'nous n'avons pas le droit d'affirmer qu'ils [the Romans] intervenaient dans ce trafic autrement que comme clients.'

ence, Joseph Needham studied the commercial interrelations of the chief Old World civilizations; he has this to say about our problem:[38] 'From the +1st to the middle of the +3rd century, Western ships (Roman in name, but actually Graeco-Egyptian) were reaching ports all around India. . . .' But let us turn to really imposing authorities on Roman commerce and economic history. On this subject our greatest authorities are probably M. Rostovtzeff and Tenney Frank. The former says,[39] about the Indian trade, 'It seems as if the commerce was concentrated in the Arabian harbours until the time of Claudius and Nero. The Arabian merchants served as intermediaries between Egyptian traders and those of India.' Later (p. 147) he adds, 'The active agents in the exchange of goods between the Roman Empire and India and China were the Alexandrian merchants. Without them the commerce with India would probably not have existed.' Tenney Frank is even more emphatic. Of Augustus Caesar's time, he wrote,[40] 'Eastern wares began to arrive at Rome in great abundance to satisfy the whims of the newly rich. . . . But Rome did not organize this commerce. The old trading peoples of the East kept it in their hands, and it is likely that Egypt, India, Syria, Arabia, and Asia profited from the new prosperity fully as much as Italy.' Hourani, who has examined this question from the Arabic side, agrees with Frank and does not agree with Mr. Bowen.[41]

As my final citation on this problem I should like to refer to Jean Hatzfeld, our greatest authority on the movements of Italian merchants in the East. After an exhaustive study of the evidence from inscriptions and literary remains this writer concluded that Italian merchants (among which Romans were a minority)[42] reached their most distant geographical extent under the Republic (about the time of Julius Caesar) and were in

[38] J. Needham, *Science and Civilization in China:* I *Introductory Orientations* (Cambridge: University Press, 1954), p. 178.

[39] M. Rostovtzeff, *The Social and Economic History of the Roman Empire* (Oxford: Clarendon Press, 1926), p. 91.

[40] T. Frank, et al., op. cit., V, 21. In the period of the Hellenistic states, Tarn believes that Arabic middlemen dominated the Indian Ocean trade, although an occasional Greek probably went all the way through from Egypt to India. See W. W. Tarn, op. cit., pp. 361-375, especially p. 370 ('in the end the Ptolemies really relied on their Arabic middlemen') and Appendix 12 on pp. 481-485. For Hourani's belief that this continued in Roman Imperial times see the next note.

[41] 'Throughout the period of the Roman Empire, Persian Gulf trade remained in the hands of small intermediary cities in which Arabs were prominent.' G. F. Hourani, *Arab Seafaring in the Indian Ocean in Ancient and Early Medieval Times* (Princeton: University Press, 1951), pp. 14-15. Hourani believes (p. 34) that there was 'a Roman fleet in the Red Sea, ready to chastise pirates,' but there are no grounds for this belief; see C. Courtois, 'Les politiques navales de l'Empire Romain,' *Revue Historique*, CLXXXVI (1939), 17-47 and 225-259. Courtois also denies (p. 250) that there is any evidence for the existence of a Roman fluvial squadron on the Euphrates. Starr (op. cit., p. 113) sees no evidence for Roman naval activity in the Red Sea.

[42] J. Hatzfeld, op. cit., p. 5.

retreat, replaced by non-Italians, by the time of the Principate[43] (31 B.C.). Furthermore, Hatzfeld argues, Italian merchants did not pass outside the area of Hellenism in the East to any significant degree in the Republican period and did not reach the limits of this area under the Empire (in Egypt, for example, being restricted to Alexandria).[44] Hatzfeld rejects completely the suggestion that Italian merchants might have gone to India by either the land route east from Syria or by the sea route from the Red Sea.[45]

Mr. Bowen's argument[46] regarding the artemon sail is a deplorable example of how scholarly research is not done. Briefly his argument is that the artemon must be Roman because it is first mentioned in the Latin writer Gaius Lucilius (*c.* 180-102 B.C.) and that, since we know that the Indians had the artemon sail by the seventh century A.D., they probably adopted the oculus from the Romans also. A glance at any standard dictionary of either Latin or Greek would have shown that the word 'artemon' is Greek,[47] derived from the Greek root *artao* meaning 'suspended' or 'hanging down.' However, the first occurrence of the word *artemo* is in Aristophanes, three hundred years before Lucilius, where it is a man's name.[48] The use of the word in Lucilius is ambiguous. This author's writings are nothing but a mass of disconnected fragments. The fragment, or fragments, in which *artemo* occurs contains only two words: 'Arabus Artemo.' If we translate this, as is usually done,[49] to mean the proper name, it says, 'Artemo is an Arab'; if we translate this to mean the sail, as Mr. Bowen would have it, it says, 'The artemon sail is Arabic.' Neither

[43] 'Aux deux premiers siècles de notre ére on assist à la decadence et à la fin des communautés italiennes de l'Orient,' Hatzfeld, op. cit., p. 189. This, it should be noted, is the very period when Mr. Bowen believes that the Romans were pushing across the Indian Ocean to India. It should also be noted that the withdrawal of Italians from mercantile activities in the East at this time was exactly parallel with the decrease of the Latin influence in the Roman fighting navy observed by Professor Starr (see n. 24 above). Both of these were but aspects of the orientalizing of Roman life which became general in the Imperial period.

[44] Hatzfeld, op. cit., pp. 176-177.

[45] Hatzfeld is most emphatic on this point (op. cit., pp. 182-185), 'Pour les autres voies qui ménent vers l'Inde, on n'y trouve aucun *negotiator*. Le trafic de l'Arabie, par Leuké-Komé et Petra, était aux mains des Nabatéens; . . . Voilà pourque les marchands italiens ne se sont pas aventurés sur la route de l'Arabie, de l'Inde, ou de la Chine, et pourquoi ils n'ont pas depassé, de ce côté, les frontiéres de l'hellénisme.'

[46] Bowen, 'Origin and Diffusion,' p. 268.

[47] *Harper's Latin Dictionary* (New York: American Book Company, 1907), p. 167, marks the word with a dagger, symbol of a Greek word. This attribution is supported by H. G. Liddell and R. Scott, *A Greek-English Lexicon* (2 vols., Oxford: Clarendon Press, revised edition, 1940), p. 248; by A. Ernout and A. Meillet, *Dictionnaire Etymologique de la Langue Latin* (2 vols., Paris: C. Klincksieck, 1951), p. 87; and by seven other dictionaries examined by me.

[48] Aristophanes, *The Archarnians*, l.850.

[49] As in the standard English version of Lucilius by E. H. Warmington, *Remains of Old Latin* (4 vols., Loeb Classical Library, Cambridge: Harvard University Press, 1935–), III, 199. My personal feeling is that this passage is too ambiguous to be used to prove anything.

translation supports Mr. Bowen's argument that this sail is Roman. As Lethbridge says[50] (in a passage which Mr. Bowen does not quote), 'this practical invention . . . may have come from the Greeks or Carthaginians,' or, if we insist on using Lucilius as an authority, from the Arabs.

I see no point in getting into any discussion about the relative merits of the Bowen 'law of diffusion' versus the Poujade 'law of diffusion,' especially as I do not place much stock in either of them. It is interesting, however, to see that Mr. Bowen tries to refute Poujade by referring to a piece of evidence which Poujade used to support his law. This evidence concerns the diffusion of the Arab lateen sail to certain portions of the Mediterranean, notably North Africa and the Iberian Peninsula. While Poujade used this to support the argument that sail patterns diffuse best where there is political domination, Bowen[51] uses this as an argument that sail patterns diffuse so easily that they need no political domination. In this case, the historical facts support Poujade, for the Saracen domination of the eastern, southern, and western shores of the Mediterranean Sea in the period after A.D. 700 (when the lateen sail seems to have been spreading) cannot be denied by Mr. Bowen.

Although, as I have tried to show, there is no evidence that Roman ships could have taken the oculus to India, I have no doubt that other ships could have taken this trait to the Indian Ocean, and even to India, centuries before there were any Romans at all. The evidence on this point is very persuasive, but, before examining it, I shall list a few conclusions about this evidence.

The conclusions to which I refer are eight in number:

1. We have almost no surviving prehistoric watercraft, since these were made of perishable materials, and we must infer the nature of such craft from representations of these or from indirect evidence.[52]

2. The existing representations of watercraft of the prehistoric and early historic periods cannot be regarded, primarily, as efforts to depict contemporary boats but must be considered, in most cases, as religious or mystical objects and hence of symbolic and traditional character.[53]

[50] Lethbridge, op. cit., p. 154.

[51] Bowen, 'Origin and Diffusion,' p. 269. I should like to point out that Mr. Bowen's other argument against Poujade (p. 269), being based on the belief that the artemon was Roman, falls to the ground with the correction of this error: for, if the artemon is Greek, it could have diffused to India during the period of over two hundred years when there was Greek political domination of portions of India. Poujade's theory is enunciated in J. Poujade, *La Route des Indes et ses Navires* (Paris: Payot, 1946), pp. 168-172.

[52] Such indirect evidence for the existence or character of watercraft, even before there are any representations of these, is frequently conclusive. For examples, see C. Quigley, 'Aboriginal Fish Poisons and the Diffusion Problem,' *American Anthropologist*, LVIII (1956), 508-509.

[53] This is quite evident to anyone who has examined a large body of this evidence; the reasoning behind this statement should emerge in the rest of this paper.

3. Even peoples who had the boat oculus for a long time did not put it on all their watercraft, but only on some of them. The basis for their decision to do so is not clear to us.[54] Accordingly, a few conclusive examples of oculi should be sufficient to establish the trait for any people.[55]

4. The oculus is clearly a religious symbol which has no necessary connection with watercraft but is placed on these or not as seems fitting at the moment. The oculus is not the 'eye' of the vessel and has nothing to do, as commonly stated, with permitting the craft to 'see its way' on the waters. The oculus is clearly a mystic symbol.[56]

5. If we are correct in regarding most representations of prehistoric or early historic watercraft as symbolic and religious and the oculus as being of the same character, we are justified in inferring that a people who put an oculus close to, but not on, a representation of a ship (especially when, as in a lineal rock carving or on a small seal, it would not be possible to depict the oculus on the hull itself), have the 'oculus-trait' which we are seeking.

6. In studying the diffusion of the ship oculus we cannot ignore the other characteristics of the vessel which diffused with it.

7. In tracing the diffusion of watercraft characteristics, including the oculus, we cannot neglect the well-established evidence for diffusion of cultural traits along the same routes and at the same periods as the diffusion of the watercraft characteristics with which we are concerned.

8. Accordingly, the diffusion of the oculus is not likely to be worked

[54] There is no dispute that Dynastic Egypt had the boat oculus, but it appears, at a rough guess, on no more than one craft out of six, and is found on all types of vessels, always in a minority of cases. See Quigley, 'Certain Considerations,' p. 197.

[55] Sherds of pottery so similar that they could well be from the same maker and showing boats which are otherwise almost identical will sometimes have an oculus on one boat, but not have it on its twin. See the reference in n. 67 below and the explanation on p. 50 that bird-and-fish, furcate branch-and-wheel, lunar crescent-and-disk, or other pairs of symbols were equivalent substitutes for the triangle-and-oculus or for the boat-and-oculus.

[56] It is quite evident that the same oculus which is found on the watercraft of a people is also found in other usages, as on ceramics. For a striking example of this, see a very oddly shaped patch enclosing an oculus on an Etruscan boat and another, identically shaped, patch enclosing an oculus on an Etruscan cup from Vulci; for the boat, A. Köster, *Das Antike Seewesen* (Berlin: Shoetz und Parrhysius, 1923), pl. 34 opposite p. 97, or Moll, op. cit., fig. 151 on pl. BVIc; for the cup, D. M. Robinson, 'Unpublished Greek Vases in the Robinson Collection,' *American Journal of Archaeology*, LX (1956), pl. I. We are all familiar with the use of the eye (generally called 'The Eye of Horus') on Egyptian objects other than watercraft.

The earliest examples of the eye on a triangle are Iranian of the fifth millennium B.C., or earlier, while, as Herzfeld said, 'A single triangle with the eye is normal for the Ubaid pottery of Prehistoric Sumer.' See E. Herzfeld, *Iran in the Ancient Near East* (New York: Oxford University Press, 1941), pp. 27-28, figs. 31, 32, and pl. VI. This continued for thousands of years. At least two millennia later, a sherd from Susa (see n. 63 below) shows a boat with a geometric oculus while in the next panel on the same sherd is an oculus on a triangle (this is late third millennium B.C.). In the Christian era, 2,500 years later again, we find the same symbols on grave steles; see references to F. Cumont in n. 79 below. Evidence of this kind, stretching over close to 5,000 years, shows that the oculus, even on a watercraft, is a symbol and not an eye for the vessel to 'see its way.' Perhaps of greater significance to us is that most surviving pictures of watercraft are also magical symbols and are not intended to show what contemporary boats were like.

out by scholars whose knowledge is limited to any single area (such as Arabia) or any single period (such as the Roman) or any single object (such as ships).

Using these principles it is possible to work out the likely course of diffusion of the oculus as one among several traits and symbols which moved outward from the Highland Zone of western Asia, at a very remote period, to Mesopotamia, the Indian Ocean, India, Egypt, the Levant, the Mediterranean, and beyond. At the moment we shall restrict our attention to the evidence on the diffusion of the oculus (and associated traits) into the Indian Ocean and to the shores of India.

In his first article Mr. Bowen argued that the Romans must have taken the oculus to India because both the Romans and the Indians had red triangles on the ends of their boats.[57] In his second article Mr. Bowen tries to argue that the Romans must have taken the oculus to India because the Etruscans and the Arabs have blue-green or green patches on their boat ends.[58] The significant fact is that the Egyptians had blue-green patches and oculi on their boats long before there were any Etruscans or Arabs. Moreover, we have historical records of Egyptian voyages to the Indian Ocean in this earlier period. Let us add to these facts two others: Arabic boats with oculi are generally sewn boats, and Arabic oculi are frequently placed on the high stemposts of their vessels rather than on the hulls.[59] Egyptian vessels were sewn, at least in the earlier period, and their ocean-going vessels frequently had an oculus on a very high stempost. Moreover, it was a vessel of this type which went to Punt and thus to the Indian Ocean for the Pharoah Sahure in the Fifth Dynasty (about 2500 B.C.). And finally, vessels of a similar type, but perhaps without oculus or sewing, continued to go to Punt, sometimes in considerable numbers, until the Twentieth Dynasty Pharoah Ramses III (1198-1167 B.C.).[60]

[57] Bowen, 'Maritime Superstitions,' pp. 21-22.

[58] Bowen, 'Origin and Diffusion,' p. 286.

[59] Mr. Bowen points out ('Origin and Diffusion,' p. 283) that carved oculi are found in South Arabia only on sewn boats and on these are high on the stem- and sternposts; for some reason, he seems to feel that this information will refute my views; on the contrary, as I show in the text above, these two points serve to support my argument that the Indian Ocean could have received the oculus from Egypt during the Fifth Dynasty.

[60] For the construction of early dynastic seagoing ships see R. O. Faulkner, 'Egyptian Seagoing Ships,' *Journal of Egyptian Archaeology*, XXVI (1941), 3-9, and P. E. Newberry, 'Notes on sea-going ships,' *Journal of Egyptian Archaeology*, XXVIII (1942), 64-66.

Punt may have been in Arabia, but the consensus is that it was on the east coast of Africa, how far south is disputed. The 'Princess of Punt,' brought back with a dog-faced baboon by Hatshepsut's expedition (*c.* 1494 B.C.) and pictured in the Temple at Deir el Bahri is a Hottentot; P. Herrmann, *Conquest by Man* (London: H. Hamilton, 1954), p. 60. The rouge of Hatshepsut is made of antimony which seems to be from the Zambezi (Herrmann, p. 57). Sahure's ship to Punt has been published in L. Borchardt, *Das Grabdenkmal des Königs Sahure* (2 vols., Leipzig: E. Assmann, 1910-1913), II, pl. 11-12, and republished many times, including Faulkner, op. cit., p. 7. That Egyptian vessels were sewn has been denied, but see Faulkner's note in *Journal of Egyptian Archaeology*,

Mr. Bowen was very emphatic that the Greeks never placed their oculi on triangular patches on the hulls of their watercraft until I provided him with evidence to the contrary.[61] Now he is equally emphatic that none of the Mesopotamian people used the boat oculus. Unfortunately, he is in error on this point also. The oculus on a triangle was a common artistic motif in Iran in the fifth millennium B.C., while in the following millennium 'a single triangle with the eye is normal for the Ubaid pottery of Prehistoric Sumer.'[62] I do not find an oculus on a boat until the second half of the third millennium B.C. (at Susa)[63] but have little doubt that they existed earlier, probably much earlier. Buff-colored, painted pottery of the type found in Iran and Mesopotamia and painted with the same designs and symbols (including the oculus) as those further west are found in a context called Kulli culture in southern Baluchistan in the early third millennium. According to Piggott, these Baluchi-Mesopotamian contacts were by sea, and, at the very time they were going on, there were active cultural contacts between the Kulli culture of Baluchistan and the Harappa culture of India itself.[64] Toward the end of the

XXVII (1941), p. 158, or J. Hornell, 'The Sailing Ship in Ancient Egypt,' *Antiquity*, XVII (1943), 27-41, 31 pp. 33-24. This feature seems to have been changed by Eighteenth Dynasty times.

We have no pictures of the vessels used in the Middle Kingdom expeditions to Punt (1935-1887 B.C.), but the five ships sent to Punt in the ninth year of Queen Hatshepsut are amply shown in the reliefs at Deir el Bahri. These, frequently republished (as in Moll, op. cit., pl. A IV, fig. 545, or in Hourani, op. cit., pl. 2), show that the oculus has been eliminated from the sternpost and the (external?) evidence of sewing on the hull is also lacking in comparison with Fifth Dynasty ships to Punt. Accordingly, if the Arabs received these traits from the Egyptians, it is more likely to have occurred in the earlier period than in the later. This would sustain my general argument that the diffusion of these, and other traits connected with ships, was relatively early.

[61] Bowen, 'Maritime Superstitions,' p. 24. I gave references, as in n. 9 above, to Greek oculi on triangles in a letter of 10 October 1945 to Mr. Dodge with a copy for Mr. Bowen.

[62] Herzfeld, op. cit., p. 28; see n. 56 above.

[63] J. de Morgan, et al., *Recherches archéologiques* (5 vols., Paris: E. Leroux, 1900-1912, forming vol. I, VII-VIII, XII-XIII of France. Ministère de l'Instruction Publique et des Beaux Arts. Delegation en Perse. *Mémoires*), I, 135, fig. 337. This sherd was republished in 1907 by G. Cros when he found, at Tello, an identical boat (but without oculus), on a sherd of the same pottery type in a similar cultural context but about 400 years older. Both boats were filled with vertical standards surmounted by lunar crescents and, in one case (in the earlier boat which lacked the oculus), by a solar disk: G. Cros, 'Mission française de Chaldée; campaign de 1903,' *Revue d'Assyriologie et d'Archéologie Oriental*, VI (1907), 5-22 and 47-66, pl. II, figs. 1 and 3. Moll (op. cit., pl. A1a, fig. 56) confused the two sherds and identified the one he published as from Tello; he also omitted the accompanying symbols outside the hull. The dates of these two sherds are roughly 2450 B.C. and 2100 B.C.

Both of these sherds were on black incised pottery, similar to Etruscan *bucchero* ware. This is a widespread type of ceremonial ware, found in very early levels of Iran, Mesopotamia, India, Egypt, Anatolia (at the first two cities of Troy) in Thrace, the Aegean, Cyprus, Spain, and elsewhere. See the references given in Cros (p. 61), also M. Raphael, *Prehistoric Pottery and Civilization in Egypt* (Washington: Pantheon Books, the Bollinger Series VIII, 1947), pp. 40-45; M. V. Seton-Williams, 'Neolithic Burnished Wares in the Near East,' *Iraq*, X (1948), 34-50 (dates these earlier than painted pottery at all sites; probably fifth millennium B.C.). At Susa the designs on the ware were of a very limited variety of subjects (Cros, p. 62): 'ce sont des bateaux, des poissons, des oiseaux d'eau comme on le remarque aussi sur la très antique poterie peinte des bords du Nile.' The significance of this will appear below.

[64] Examples of the oculus on Quetta, Kulli, and Harappa pottery of the third millennium B.C.

third millennium, when we know that the boat oculus was available in the Mesopotamian area, we have convincing evidence that the cultures of the Two Rivers were in contact with the Indian Ocean and probably with India itself by sea. Sumerian documents from the Royal Graves at Ur speak of voyages to Dilmun, to Magan, and to Meluhha. The first of these is Bahrein Island, an important trading site of the day, while Magan seems to be Oman since the copper used at Ur has been shown to have the same percentage of nickel impurity as that produced by the mines at Sohar. Meluhha is probably northwestern India because of the objects from Harappa and Sind found in Ur. That this contact was by sea seems assured from the fact that Indic stamp seals have been found both on Bahrein Island and at Ur.[65]

So far we have seen that shipping from both Mesopotamia and Egypt was coming to the Indian Ocean, if not to India itself, in the third millennium B.C., at a time when both localities were acquainted with the boat oculus. In the case of Mesopotamia the shipping to India seems to have ceased in the second millennium, at that uncertain date when the Indic civilization reached its final collapse; in the case of Egypt, shipping to the Arabian Sea area continued many centuries later, to the time of Ramses III (1198-1167 B.C.). About two centuries after this last Pharoah, a new people, the Phoenicians began shipping in this same area in collaboration with King Solomon of Israel (*c.* 961-922 B.C.). These Phoenicians may have gone as far as India; at any rate they reached the Indian Ocean and they certainly had the boat oculus.[66]

will be found in S. Piggott, *Prehistoric India* (Harmondsworth: Penguin Books, 1950), pp. 73-75, 99-104, 192-195, and figs. 3, 6, 7, as well as pls. 6 and 7. The Quetta oculus is on a triangle (Piggott, fig. 3) and dates about 3000 B.C. The same oculus, but on an oval rather than a triangle, is found at Mohenjo-Daro on pottery of about 2400 B.C.; see E. J. H. Mackay, *Further Excavations at Mohenjo-Daro* (2 vols., Delhi: Government of India Press, 1938), I, 217 (called 'eyes'), p. 641 (date), and II, pl. LXVIII, fig. 24 (oculus with birds and tree). For contacts by sea, see Piggott, pp. 115-118, 143-144, and 207-210.

[65] C. J. Gadd, 'The Royal Graves at Ur,' *The Listener*, LIII (3 March 1955), 373-376; Hourani, op. cit., p. 6, and n. 6; for evidence of trade contacts between Ur and central India before 3000 B.C., see Sir L. Woolley, *Excavations at Ur* (New York: Crowell, 1954), p. 33; for second-millennium trade from Ur to the sea and to India, see Woolley, op. cit., pp. 112-113 and 116; R. C. Majumdar, *The History and Culture of the Indian People: the Vedic Age*, pp. 179 and 192, and Piggott, op. cit., pp. 116-118. According to Hornell, shell ornaments found at Ur, Kish, and Lagash in the third millennium B.C. but lacking in the second millennium were made of the chank found only in Ceylon and southern India and 'the presence of articles made from the chank is positive proof of commercial intercourse with India,' J. Hornell, 'Sea Trade in Early Times,' *Antiquity*, XV (1941), 233-256, at pp. 239-240.

[66] Mr. Bowen says (p. 278) that 'The only evidence we have of Phoenician oculi comes from coins'; if he will look at M. Dunand, *Fouilles de Byblos* (2 vols., Paris: Paul Geuthner, 1937), I, 223-225, he will find several Phoenician oculi on paintings or models. He also says (p. 281, also p. 278), 'none of the representations we have of Phoenician craft show oculi at both ends,' and, on this erroneous belief, he tries to argue (p. 281) that the Romans were the first to place an oculus at the stern and, accordingly, that my statement that Semites might have taken the oculus westward across the Mediterranean is wrong: again, if Mr. Bowen looks at the reference I have given in Dunand, I, 223-225, and at object No. 3306 on pl. CXL in Vol. II, he will find a clay model of a Phoenician fishing boat,

We know of still another people, the Greeks, who were perfectly familiar with the boat oculus and who built and operated ships in Indian waters in the period before the first Roman oar was dipped into the Tyrrhenian Sea. These Greeks and Macedonians under Alexander the Great reached India overland in 326 B.C. and built a great fleet of ships on the lower Indus River. Under the leadership of Nearchus a commercial connection by sea was opened from northwestern India to the Persian Gulf and to Babylon.[67] This trade continued, under Greek control, in Phoenician-built ships operated by Syrian and Greek-trained sailors, for many generations. Gradually these routes were taken over by Indians and possibly by Arabs but there can be no doubt that these non-Greek peoples had many opportunities to become acquainted with the Greek boat oculus before the last 'Yavana' merchants disappeared in the first century B.C.[68]

The second portion of Mr. Bowen's 1957 article is devoted to an attack on the alternative suggestions regarding the origin and diffusion of oculi which I gave in my article. Mr. Bowen has difficulty doing this because, as he complains (on page 271), it is not clear what I do believe. That is quite correct; in my first article I had no intention of revealing my own opinions on this problem, but rather listed alternative possibilities which seemed preferable to Mr. Bowen's ideas.[69] As for my real beliefs, these should not have been a mystery to Mr. Bowen since they had been conveyed to him in a letter, dated 10 October 1955, which I sent to Mr. Dodge with a copy for Mr. Bowen. At that time I wrote, 'Mr. Bowen tries to impose on me[70] a belief in a Semitic invention of the oculus. Frankly, I do not believe that the evidence is available to determine in any dogmatic way who invented the oculus, but I do believe that it was largely diffused by the Semites. My own personal feeling about its invention is that, like so many symbols of pre-Dynastic Egypt, of geometric Greece, and of

dated second millennium B.C., showing oculi at both ends. Mr. Bowen questions (p. 273) my dating of the Phoenician-Carthaginian influence in the western Mediterranean as 900-200 B.C. (at Quigley, 'Certain Considerations,' p. 195). These are the generally accepted dates, ending with the Second Punic War (218-201 B.C.) and beginning at the turn from the tenth to the ninth century. On the last point see, *inter alia*, W. F. Albright, *The Archaeology of Palestine* (Harmondsworth: Penguin Books, 1949), pp. 122-123.

The maritime collaboration of Kings Hiram of Tyre and Solomon of Israel in the Red Sea from Ezion-geber is an old story. See J. Hornell, 'Naval Activity in the Days of Solomon,' *Antiquity*, XXI (1947), 66-78 (Ophir is India), and G. F. Hourani, op. cit., pp. 8-10; Majumdar offers valuable philological evidence to suggest that Ophir was in India, see R. C. Majumdar, ed., *History and Culture of the Indian People: The Age of Imperial Unity*, pp. 611-613.

[67] W. W. Tarn, *Alexander the Great* (2 vols., Cambridge: University Press, 1951), I, 100-109.

[68] W. W. Tarn, *The Greeks in Bactria and India*, pp. 260-261 and Appendix 12.

[69] Notice the last paragraph of Quigley, 'Certain Considerations,' p. 198, where every sentence has a hypothetical expression such as 'it might be said' or 'may be' or 'it would seem,' etc.

[70] In a letter addressed to me, dated 23 September 1955.

megalithic Bronze-Age Europe, the oculus may go back to the proto-Elamites. The evidence to support this would be mostly circumstantial and could not be mobilized except in a rather lengthy book or in numerous articles.' Without attempting to be conclusive I should like to use the space left to me to show the kind of evidence which led me to this idea.[71]

The earliest agricultural peoples of western Asia (sixth millennium B.C.) were gardeners rathers than farmers.[72] They practiced a semi-nomadic hoe culture in which the women grew crops while men continued to hunt (and perhaps to herd animals). Their greatest desires, for children and for food, led them to an obsession with the capacity of women to produce children and of the earth to produce crops; they tended to merge these two, regarding a pregnant woman as a symbol of Mother Earth and the earth as a pregnant mother. From this came the idea of an Earth Mother Goddess and of a fertility cult.[73] The fertility of woman was concentrated in the pubic region, symbolized by a triangle,[74] and the fertility of the earth was concentrated in a mound or hill, also symbolized by a triangle (the Sacred Mountain).[75] Because of the parallel rhythm of woman's sexual cycle and the phases of the moon (still reflected in the etymological relationship: moon-month-menses), the lunar crescent (and, more rarely,

[71] From this point on, the references in this paper are not intended to be exhaustive or conclusive, but are suggestive and random selections from an enormous literature. In many cases I refer to a less scholarly but more available work rather than to a more scholarly work which might be difficult to find.

[72] For a convenient introduction, see V. G. Childe, 'Old World Prehistory: Neolithic' in A. L. Kroeber, et al., *Anthropology Today* (Chicago: University Press, 1953), pp. 193-210, or R. J. Braidwood, *The Near East and the Foundations of Civilization* (Eugene, Oregon: State System of Higher Education, 1952).

[73] A cult of pregnant women seems to have existed in the palaeolithic period, but it is not a fertility cult as it has nothing to do with growing crops or with the earth as a mother. Most of the works on this subject are worthless and even the best must be used with extreme caution (because of Freudian preconceptions or other weaknesses). See J. Przyluski, *La Grande Déesse* (Paris: Payot, 1950), or E. Neumann, *The Great Mother* (New York: Pantheon Books, Bollingen Series XLVII, 1955; Jungian, but with 185 valuable plates and 74 text figures).

[74] Early female torso figurines lacking all features except breasts and sharply marked pubic triangles are common; see C. Zervos, *L'Art de la Mesopotamie de la fin du quatrième millénaire au XI'e siècle avant notre ère. Elam, Sumer, Akkad* (Paris: Editions 'Cahiers d'Art,' 1935), pls. 51, 157, or E. Neumann, op. cit., pls. 6, 8, 10-14, 16-17, and 23; some have no features but triangle, breasts, and snake about neck; see Zervos, op. cit., pl. 174. A similar figure from the Cyclades, end of third millennium B.C., has recently been published in H. Read, *Icon and Idea* (Cambridge: Harvard University Press, 1955), pl. 43. For the origin and meaning of the triangle as a symbol, especially on incised pottery associated with the megalithic movement, see H. Rydh, 'On Symbolism in Mortuary Ceramics,' Museum of Far Eastern Antiquities, *Bulletin*, No. 1 (1929), pp. 71-142, esp. pp. 81-85 (a symbol of female fertility), and pp. 99-100 (source of the ax symbol). For the Christian use of this as a funerary symbol see the reference to Cumont in n. 79 below.

[75] See H. Frankfort, *The Birth of Civilization in the Near East* (Bloomington: Indiana University Press, 1951), pp. 54-55; H. G. Quaritch Wales, *The Mountain of God, a Study of Early Religion and Kingship* (London: Bernard Quaritch, 1953); V. I. Avdief, 'Geometrical Ornament on Archaic Egyptian Pottery,' *Ancient Egypt and the East* (June 1935), pp. 37-48; M. Raphael, op. cit., pp. 46, 62, 77-83.

the lunar disk) became a symbol for the Earth Mother Goddess.[76] As the source of fertility and the growing plants, this deity was also symbolized by a sheaf of grain, a reed bundle, or a multifurcate branch. To insure fertility of the domestic animals, this last symbol, in the form of two reed bundles, in a V-shaped pattern with the tops forming volutes, was placed over the entrance to each animal shed.[77] At the same time, these people had a number of other traits and beliefs which should be mentioned: they had a duodecimal system of counting, believed that their gods traveled through space in boats, and believed that their dead went to the hereafter in a boat.[78] Since the crops and vegetation, by the power of the Earth Mother and her subterranean life-giving waters, were able to revive after their annual death in the summer drought, it was felt that the Earth Mother and her symbols could insure revival to eternal life in the hereafter for the human dead, if these symbols were inclosed in the grave. These beliefs gave such traits as boat burials (or presence of model boats in graves), piling of a life-giving mound of earth over the dead, and the placing of various symbols of the Earth Mother in, over, or near the graves of the dead.[79] It is very likely that these peoples spoke an agglutina-

[76] G. Contenau, *Manuel d'Archéologie Orientale* (4 vols., Paris: Picard, 1927-1947), II, 768; C. Hentze, *Mythes et Symboles Lunaires* (Antwerp: Editions 'De Sikkel,' 1932); F. Cumont, 'Le Symbolisme Lunaire dans l'Art Funéraire Romain,' in his *Recherches sur le Symbolisme Funéraire des Romains* (Paris: Paul Geuthner, 1942), pp. 203-252.

[77] E. D. van Buren, 'Amulets, symbols, or idols?,' *Iraq*, XII (1950), 139-146; Frankfort, *Birth of Civilization*, p. 57; Frankfort, 'Ishtar at Troy,' *Journal of Near East Studies*, VIII (1949), 194-200 at p. 196, fig. 1 (over sheep pen), or E. Neumann, *The Great Mother*, pl. 124. This symbol became the symbol for life everlasting and developed into the headless torso ('hut symbol'), the 'spectacle symbol,' and the face urns found over wide areas; among other things it turned into Athena's owl and the widely found bird-faced goddess. As 'spectacle symbol' it stood for the Mesopotamian mother goddess and was used in Egypt during pregnancy; see Frankfort, 'A Note on the Lady of Birth,' *Journal of Near East Studies*, III (1944), 198-200. It crossed the Mediterranean to Spain and passed up the Atlantic to western Europe and Bronze-Age Scandinavia with the same megalithic movement which took the oculus; see Herzfeld, op. cit., pp. 148-154, pl. XXX, and fig. 273; M. E. L. Mallowan, 'Excavations at Brak and Chagar Bazar,' *Iraq*, IX (1947), 1-266, at pp. 198-210; O. G. S. Crawford, *The Eye Goddess* (London: Phoenix House, 1957); A. W. Brøgger and H. Shetelig, op. cit., p. 38.

[78] The boat, symbolized by a crescent, merged with the Earth Mother (symbolized by a lunar crescent) who traveled in it, and these became vehicles to everlasting life in the hereafter. On boats as vehicles of the gods and, more widely, as funerary symbols, see N. Schneider, 'Götterschiffe im Ur III Reich,' *Studia Orientalia*, XIII (1947), fasc. 3; A. M. Abubakr, 'Divine Boats of Ancient Egypt,' *Archaeology*, VIII (Summer 1955), 96-101; L. V. Grinsell, 'The Boat of the Dead in the Bronze Age,' *Antiquity*, XV (1941), 360-370; A. B. Cook, *Zeus, a Study in Ancient Religion* (3 vols., Cambridge: University Press, 1914-1940), II, 516-525, at p. 521; S. Marinatos, 'La Marine Créto-Mycenienne,' *Bulletin de Correspondance Hellénique*, LVII (1933), 170-235 (evidence); M. P. Nilsson, *The Minoan-Mycenaean Religion* (Lund Gleerup, 1927), pp. 368-387 (discussion); V. G. Childe, *Prehistoric Communities of the British Isles* (London: Chambers, third edition, 1949), pp. 129-130; H. Shetelig and H. Falk, *Scandinavian Archaeology* (Oxford: Clarendon Press, 1937), pp. 165-166; A. W. Brøgger and H. Shetelig, *The Viking Ships*, pp. 35-36 and 69-109.

In classical antiquity the influx into the Mediterranean of Northern ideas of sky-gods put an end to the Eastern idea of gods traveling in boats, the chariot being used instead, but the idea of the underworld as a place to be reached by boat still survived until its final vestige in Charon's ferry.

[79] All of these continued to be used as funerary symbols down into Christian times. Indeed, the

tive language (neither Indo-European or Semite), were matrilineal, and had strong matriarchal elements.[80]

At a later stage, these peoples developed sedentary agriculture in alluvial or irrigated areas, using the plow. Farming became a masculine activity, and masculine elements became emphasized in their economic, social, religious, and intellectual life. Without discarding the older female traits and symbols, new male ones were added. Fertility was supplemented by virility with emphasis on the male rôle in making the earth produce fruit or the woman produce children. The phallus and the plow were, to some extent, identified, as women and the earth had previously been identified. The Earth Mother Goddess was given a male god as a companion, either as son or lover (or both), and this male deity was regarded as god of the underworld, the crops, and the dead as his mother had been. His cycle, however, was annual rather than monthly, and was marked by a withdrawal and return (death and resurrection) associated, in time, with the annual advance and retreat of the sun and the death and revival of the crops.[81] Naturally, complications developed in this seasonal cycle as these peoples migrated to areas where crops grew in the summer and died in the winter (as in temperate Europe) rather than the opposite (as was the case in the Mediterranean or southwestern Asia). As knowledge of the year and the development of a solar calendar advanced, probably at a somewhat later date, the male god came to be identified with the sun and was increasingly modified or even replaced by a solar sky god (instead of the older deity of the underworld). The male god of virility came to be symbolized by the phallus, the pillar, the fish, the sun disk, the oculus, the wheel, the chariot, and the bull. His messenger was the eagle, where

grave mound and upright headstone today are derived from these early symbols. F. Cumont, *Recherches sur le Symbolisme Funéraire des Romains* (Paris: Geuthner, 1942), while generally unaware of the great antiquity of these symbols, gives numerous examples of their use in the classical period. Of the triangle he says (p. 223), 'Il est donc certain qu' . . . on attachait à cette figure géometrique une signification funéraire,' and quotes W. Deonna in *Revue des Etudes Grecques*, XXIX (1916), 1-10, for many examples going back to the Bronze Age. The use of the crescent usually inclosing a sun disk or star is shown on dozens of funeral objects (pp. 203-252); some steles (as figs. 44 and 45 on p. 223) have crescent and star on a triangle. The use of a ship on such steles was also common, even in the Christian period. Moll, op. cit., pl. Bxb, figs. 71 and 72, shows two from Tunis with high furcate sterns.

[80] R. Ghirshman, *Iran* (Harmondsworth: Penguin Books, 1954), pp. 28, 44; E. E. Herzfeld, op. cit., pp. 10-11.

[81] The classic work, of course, is Sir J. G. Frazer, *The Golden Bough* (12 vols., London: Macmillan; various editions, 1900–1924), esp. *Adonis, Attis and Osiris* (third edition, 1914) and *The Dying God* (1911). Knowledge of this god of death, the underworld, and the crops spread westward, leaving the Near East before 3000 B.C., to western Europe and the British Isles (where he was known as Samhain and honored on the day we recognize as Allhallows Day); see J. W. S. Sewell in S. R. K. Glanville, ed., *Legacy of Egypt*, pp. 7-10, and R. Linton, *Halloween* (New York: Schuman, 1950), esp. p. 14.

the Earth Mother's messenger had been the snake. In time a certain amount of confusion arose between symbols: between the full moon and the solar disk, between the reed bundle or furcate branch and the tree[82] (=pillar or phallus), between the Earth Mother's waterbird (usually called a swan, duck, or ibis) and the sun's eagle.

As the male underworld deity of virility began to grow in popularity, he shared the functions which the Earth Mother had possessed as protector of life everlasting, guide to the hereafter, and guaranteer of the harvest. By recognition of the fact that crops or children can be produced only by a combination of male and female, of phallic rod and pubic triangle, of plow and earth, there arose a series of combined symbols representing fruitful life and victory over death. These included triangle and rod (eventually identified as an ax symbol), bird and pillar, bird and tree, snake and eagle, triangle and oculus, pyramid and obelisk, ship and chariot, furcate branch and fish, bird and fish, water and fish, or crescent and disk.[83]

These archaic peoples, being of a mythological outlook rather than the logical outlook with which we are familiar, sometimes permitted their symbols to merge or blur in a fashion which is nonlogical to us. For ex-

[82] On the phallus as suggesting life after death, see M. P. Nilsson in *Harvard Theological Review*, XLVI (1953), 191. On the sacred tree see H. Danthine, *LePalmier-Dattier et les Arbres Sacrés dans l'Iconographie de l'Asie Occidentale Ancienne* (2 vols., Paris: Paul Geuthner, 1937); G. Widengren, *The King and the Tree of Life in Ancient Near Eastern Religion* (Uppsala: Universitets Arsskrift, No. 4, 1951); O. Viennot, *Le Culte de l'Arbre dans l'Inde Ancienne* (Paris: Presses Universitaires de France, 1954, forming Vol. 54 of *Annales de la Musée de Guimet;* covers Cretan and Mesopotamian evidence as well as India).

[83] For the origins of these symbols, see E. E. Herzfeld, op. cit.; for meaning and early diffusion, see E. Pottier, 'Céramique peinte de Suse et petits Monuments de l'Époque Archaique,' *Mémoires de la Délegation en Perse*, XIII (1912), 27-103 (from Proto-Elamite to early Mesopotamia to Crete, p. 87); R. Dussand, 'Motifs et Symboles du IVe Millénaire Dans la Céramique Orientale,' *Syria*, XVI (1935), 375-392.

Volumes could be written on the diffusion of these symbols. To take but one, the triangle and rod (ax symbol) and, to a lesser extent, the double triangle and rod (double ax) followed the same routes of diffusion at the same time as the spectacle symbol (see n. 77), the ship symbol, the oculus, the solar wheel, and the developing megalithic monuments. The triangle and rod on the Dolmen du Petit Mont in Brittany can be traced with at least eight other symbols to Iberia and across the Mediterranean to the Near East and ultimately to Iran 2,000 years earlier. In Egypt, where this symbol came in from the East as triangle and rod, it became the symbol and hieroglyph for deity. See V. I. Avdief, op. cit., at p. 41, and P. E. Newberry, 'The Cult of the Pole,' *Journal of Egyptian Archaeology*, XXXIII (1947), 90-91. The double ax, although rare, is also found in Egypt, in the very early period, not once (as Baumgartel believed) but more than once; see E. Baumgartel, *The Cultures of Prehistoric Egypt* (London: Oxford University Press, 1947), p. 47 and, for another example, on an Amratian pot, M. Raphael, op. cit., pl. XVI, fig. 5. In Crete, in the form of the double ax, it became the dominant religious symbol; see A. B. Cook, op. cit., II, 513-703. Without the rod, this is one of the oldest symbols in Iran being found at the Sialk I level; see R. Ghirshman, op. cit., p. 30, fig. 4. The symbol had the same significance with and without the rod (as double triangle or double ax) and is found both ways on the same pot; see A. Roes, *Greek Geometric Art, its Symbolism and its Origin* (London: Oxford University Press, 1933), p. 74, or the paper of Rydh mentioned in n. 74. In combination with the reed bundle, the rod, ax, or double ax became the fasces, a symbol of life, power, and, ultimately, of political sovereignty; see next note.

ample, the sun represented as a sunburst of diverging rays or as a spoked wheel without its rim, could be symbolized in a way that we would call a star and was regarded as a male symbol, but the planet Venus, as the daughter of the sun and the moon, was also represented as a star and was a female symbol. Or a triangle pointing downward was the old female symbol, but a triangle pointing upward became a male symbol. Thus star and crescent, or two triangles placed tip to tip, or a triangle and rod (ax symbol), or a reed bundle and rod (fasces) were symbols of vigor, fruitfulness, and life.[84] Another source of confusion arose from the fact that these symbols frequently moved outward from the agglutinative-speaking Highland by way of the Semites of the Southern Flatlands or of the Indo-Europeans of the Northern Flatlands. Both of the latter peoples passed from the patriarchal, warlike, hunting stage to the patriarchal, warlike, pastoral stage without passing through the stage of peaceful, matrilineal, gardening culture. To the Semites, as pastoral peoples, the moon was more significant than the sun and, as patriarchal peoples, the male was more significant than the female, so that they possessed, from a very early period, ideas of a male moon god and a female sun god. This created considerable confusion when these Semites acted as intermediaries for transferring the Highland Zone's vital symbols.

These symbols and their associated ideas may be listed as follows:

Female	Male
Hoe	Plow
Earth Mother	Male god of underworld
Fertility	Virility
a. vulva	n. phallus
b. triangle	o. pillar (May pole)
c. mound of earth	p. tree (date palm?)
d. water (underground)	q. fish
e. moon	r. sun
f. lunar crescent	s. solar disk
g. reed-bundle (furcate branch)	t. eye
h. bird (ibis, swan, goose)	u. wheel (swastika)
i. ship	v. chariot
j. snake (wand of Aesculapius)	w. eagle (hawk)
k. month	x. year

[84] The basic work, which I have not seen, is W. B. Kristensen, 'De Romeinsche Fasces,' *Mededeelingen der Koninklijke Akademie van Wetenschappen te Amsterdam* (1932), pp. 11 ff., but this is digested in A. Roes, op. cit., pp. 76-84. An early version of the fasces, known as the *baresma* goes back to Iran at an uncertain date; see C. Huart, *L'Iran Antique, Elam, et Perse* (Paris: Albin Michel, revised, 1943), pp. 392, 434. The fasces is still carried on the United States ten-cent coin, while, in a similar symbolism, an oculus and pyramid are on the American one-dollar bill and on the Great Seal of the United States.

l. cow
m. pyramid (dolmen)
y. bull
z. obelisk (menhir, stele)

joint symbols

ax
double ax
luni-solar standard
life symbol

The movements of these symbols outward from the Highland Zone, where they seem to have originated among agglutinative-speaking peoples who were the earliest farmers, are very complicated, as they traveled for thousands of years, both by cultural diffusion and migration, in many different directions, by land and by sea. Most, if not all, of these symbols originated in the Highland Zone between Seistan and Anatolia, probably in Iran. The earliest appearance of most of them was on incised, blackish pottery, but they soon appeared on painted pottery. Both of these, but chiefly the latter, carried the knowledge of agriculture and the earliest of these symbols (at least symbols a - h) outward by land, eastward across Turkestan to the Yellow River and, even earlier, to the alluvial river valleys of Mesopotamia, the Nile, and the Indus. This movement, which originally had nothing to do with the oculus or solar symbols, brought agriculture to Europe after 3500 B.C. by way of Anatolia, the Aegean, the Balkans (Vardar-Morava route), the Danube, Hungary, Switzerland, the Rhine, and northern France, entering southern England about 2000 B.C.

Later movements, mingled with movements from the growing city-civilizations of the alluvial valleys, carried the later symbols outward. From the Persian Gulf area, these movements went by sea to southern India, to southern Arabia, and, by way of the Red Sea and Wadi Hammamat, to Upper Egypt. Other movements went by land across Arabia (and thus to the Semites), across the Caucasus Mountains (and thus to the Indo-Europeans), and across Syria to Anatolia, to Palestine, and to Lower Egypt. From Syria a movement generally known as the megalithic movement crossed the Mediterranean westward to Spain in the period 4000-2700 B.C. and then, by way of the Atlantic, reached Cornwall, Ireland, and Denmark in the period 2500-2000 B.C.[85]

[85] Mr. Bowen tries (p. 273) to combat my statement that the oculus was taken to Europe by the megalithic movement by quoting a statement made by Professor Albright in a private letter to Mr. Bowen, apparently in answer to a question. Since we are not told what the question was, it is a little difficult to assess the answer. At any rate, no archaeologist who has studied the subject would agree that the megalithic movement was a 'myth'; the chief disagreement is whether it was a migration of peoples or merely a cultural diffusion. In the sense I use the word, it need be only the latter, although all the trend, in the last two decades has been to accept a migration of peoples as well. Childe, Herzfeld, Schaeffer, Hawkes, Serner, Daniel, and others regard this movement as one of colonization as well as trade. On this, see V. G. Childe, *Prehistoric Migrations in Europe* (Oslo:

Most of the symbols we have listed, along with others (such as the zeta symbol or the water symbol) we have not mentioned, can be traced from the Near East to northwestern Europe along the megalithic route and in the period before 1200 B.C. We have already given the evidence for at least five of these (ship, triangle, oculus, reed bundle, and triangle and rod or ax symbol).

Others such as the wheel symbol[86] can be traced the whole route, while some, such as the bird and fish, have not been traced all the way. The last

Aschehong, 1951), pp. 58-82; E. Herzfeld, op. cit., pp. 158-165; C. F. A. Schaeffer, 'Les Porteurs de Torques,' in his *Ugaritica II* (Paris: P. Geuthner, 1949), pp. 56-115; C. F. C. Hawkes, *The Prehistoric Foundations of Europe to the Mycenaean Age* (London: Methuen, 1940), ch. V., esp. pp. 129, 168-170; A. Serner, *On 'Dyss' Burial and Beliefs about the Dead During the Stone Age* (Lund: H. Ohlsson, 1938; finds origin in Arabia, with subsequent diffusion over area from Scandinavia to Indonesia); J. Myres, 'Cupola tombs in the Aegean and Iberia,' *Antiquity*, XXVII (1953), 3-11 (criticism of idea of D. J. Wölfel that megalithic movement was from Spain to Aegean by upholding reverse on a chain from Arabia and Palestine to Spain and Ireland); G. K. Leisner, *Die Megalithgräber der Iberischen Halbinsel* (Berlin: de Gruyter, 1943); G. L. Daniel, 'The Dual Nature of the Megalithic Colonisation of Prehistoric Europe,' *Proceedings of the Prehistoric Society*, VII (1941), 1-49; J. Corbel, 'Les Routes Commerciales du Nord aux IIe et IIe Millénaires: L'Ambre, L'Or, L'Étain,' *Les Annales*, VI (1951), 179-183 (Mediterranean leaders were chiefs in North reaching Spain by sea before 3000 B.C.).

Professor Albright's statement that megalithic culture has not been found south of Palestine is equally objectionable since the greatest display of such megalithic remains is in Ethiopia and these are usually linked to Southern Arabia, as by Father Azaïs or A. Kammerer; see F. Azaïs, *Cinq Années de Récherches Archéologiques en Éthiopie* (2 vols., Paris: Geuthner, 1931), especially I, vii (on similarity with megalithic of France), or A. Kammerer, *La Mer Rouge, l'Abyssinie, et l'Arabie depuis l'Antiquité* (6 vols., Cairo: Societé Royale de Géographie d'Égypt, *Mémoires*, t. 15-17, 1929–1932), esp. II, 198 ('Les dolmens et menhirs peuvent être très anciens. Leur parfaite ressemblance avec ceux de la Transjordanie et de la Palestine, apparentés aux monuments similaires trouvés dans toute l'Europe permet de penser que cette forme mégalithique a été importée au Harrar par l'Arabie méridionale et la mer Rouge'). To Professor Albright's blunt statement on the megalithic, 'No trace has been found in Egypt,' I shall simply contrast a statement of V. G. Childe about very early Egyptian tombs in the necropolis of Ezbet el-Walda, 'The result is something really comparable to the megalithic tombs of western and northern Europe, just as the boat graves in the same cemetery and at Saqqara might reveal the inspiration of boat burials of the Bronze Age in Britain and Scandinavia'; Childe, *New Light*, p. 86. Albright's similar statement about the absence of the megalithic south of Iran could be refuted by dozens of quotations from experts on this subject, but I'll quote once again from Childe, 'The celebrated Indian dolmens . . . are concentrated in the south of the Peninsula in areas not likely to be affected by land-borne impulses from Iran'; Childe, 'Megaliths,' *Ancient India*, No. 4 (1947–1948), p. 10. On this, see n. 99 below.

[86] The wheel, as a symbol of the sun, is older than wheeled vehicles. The vehicle wheel possibly arose from the observation that sun disks would roll; Childe, *New Light*, p. 110, and pl. XIX (earliest picture of a spoked wheel on pottery from Level VI of Hassuna, about 4000 B.C.). The symbol spread as a spoked wheel, or (lacking the outer circle) as a sunburst, or (lacking the spokes) as a solar disk or geometric oculus, or as a swastika. These were equivalent and used interchangeably; Greek ships of the geometric period (before 700 B.C.) frequently have a wheel symbol on the bow in place of an oculus; see A. Koster, op. cit., pls. 18, 21, 22, 25, or Moll, op. cit., pl. B VIa, figs. 14, 21, 27-29, or 32. Moll must always be checked against the original sources because he usually omits all symbols except those actually on the hull of the ship; since the ship itself is a symbol, frequently only one among many on a vase, this means that Moll is omitting most of the symbols on the vase. For example, a comparison of Moll, pl. B VIa, fig. 14, with the full-page photograph in G. La Roerie, *Navires et Marins* (2 vols., Paris: Duchartre et Van Buggenhoudt, 1930), I, 40, shows the ship surrounded by many double triangles, four water birds, four sunbursts, another wheel, two dotted sun disks, and other symbols. For wheels on megalithic monuments of northwestern Europe and Scandinavia (at a time when they certainly did not have spoked-wheel vehicles) see M. Péquart and Z. Le Rouzic, op. cit., pp. 57-59 and pls. 73, 80, 81, etc.; H. Shetelig and H. Falk, op. cit., pp. 159-160. In general, see A. Roes, op. cit., pp. 10-29.

of these, in spite of the incompleteness of my own research, might be of special interest to readers of THE AMERICAN NEPTUNE since it has been used on ships in modern times.

Lethbridge speaks of observing a bird and fish painted on the bow of a modern English boat and, for some reason, regards these as 'a rudimentary oculus.' It is, of course, exactly what it seems to be, a bird and fish which in ancient west Asian symbolism was equivalent to triangle and oculus or to boat and oculus. It can be traced from Iran before 4000 B.C., spread over most of the Near East and the eastern Mediterranean in the next few millennia, and may have reached extreme northern Europe during the Bronze Age.[87]

In so far as the diffusion of these symbols was along the megalithic route, much of it was by sea. This is obviously true of the boat oculus. Because of the perishable materials from which watercraft were made, the evidence available on the diffusion of shipbuilding techniques is much scantier than that available on the movement of the symbols we have mentioned. Accordingly, the evidence on symbols can be used to supplement the insufficient evidence available on ship construction.

However, the evidence available on ship construction techniques is much more adequate than is usually realized so that a tentative pattern of diffusion can be worked out using this evidence alone. If this pattern of diffusion, based on ship construction, supports, as it fully does, the pattern of diffusion of symbols based on the more permanent and more plentiful materials of these, we can be fairly certain that we have worked out the diffusion pattern of the boat oculus.

[87] The bird is well known as a symbol of the Earth Mother Goddess, but the fish as a symbol of her male consort is, perhaps, less familiar. For the fish symbol, see F. Dölger *Ichthys, der Heilige Fisch* (5 vols., Munster: Aschendorff, 1922–1939), I, 425-431, and all II; or C. Hentze, *Le Poisson comme Symbole de Fecondité dans la Chine Ancienne* (Bruxelles: Vromant, I [1930]); or C. Hentze, *Mythes et Symboles Lunaires*, pp. 118-148; or R. Eisler, *Orpheus the Fisher* (London: J. M. Watkins, 1921). The fish, originally a phallic symbol (Dölger, I, 429, n. 2), became the symbol of virility and thus of the Earth Mother's consort (Osiris, Adonis, etc.), and thus the symbol of life everlasting and of resurrection. Thus from the fourth, or even the fifth millennium B.C., bird and fish were female and male symbols of deity and resurrection; from at least the fourth millennium water and fish, or boat and fish, had the same meaning. Thus the picture of a ship with fish published by Bowen, 'Origin and Diffusion,' fig. 1, is only incidentally a picture of a ship but is really an immortality symbol, the swan neck at the stern, pointed out by Mr. Bowen in his caption, being an additional symbol of the mother goddess, in this case, Isis.

Thus Lethbridge's 'bird and fish' on a boat has a long tradition behind it. An early example of the combination is about 4000 B.C. in Samarra; see E. Herzfeld, op. cit., p. 59, fig. 107. Later we have ship, bird, and fish from fourth millennium Mesopotamia: O. Weber, *Altorientalische Siegelbilder* (2 vols., Leipzig, J. C. Hinrichs; forming *Der Alte Orient*, Jahrgang 17 and 18), II, fig. 410 (republished in Moll, op. cit., pl. AIa, fig. 3). The same three symbols are together on the pottery of Amratian and Gerzean Egypt, in Dynastic Egypt, in Tello about 2450 B.C., in Crete in the second millennium B.C., on multitudes of Greek vases of the geometric period, and continued together into classical Greece, Achaemenid Persia, and the Christian world, both Latin and Byzantine. Many reproductions in Moll, as on pl. BVIa, figs. 8, 11, 12, 14, 21, 22, 27, 28, etc., show ships with birds or fish or both.

The pattern of ship construction techniques can be followed by using eleven characteristics of prehistoric or early historic ships:[88] 1. The sail; 2. The spade-shaped paddle; 3. High prow and higher stern; 4. The furcate branch decoration; 5. Sewn construction; 6. Dugout base (or keel); 7. Adz-cut strakes with integral cleats; 8. Ribs to attach strakes by cleats to base (or keel); 9. Carvel construction; 10. Use of treenails and wooden dowels to hold strakes; 11. Bifid prow.

These shipbuilding techniques diffused outward from their origins in the Near East at a very early period before the use of plank-cutting saws or metal nails, as is evident from the fact that at least four of these features (nos. 5, 7, 8, and 10) become obsolete with the advent of the sawed plank, nailed boat. Another indication of the early diffusion of these features is the fact that some of them (nos. 3, 4, 5, 7, 8, 10, and 11) were found, in the historic period, only in peripheral, remote, and backward areas. I shall speak, at this time, of no more than a few of these eleven points.

The sail and the spade-shaped (almost triangular) paddle seem to have spread together, but are of little help to us as they went no farther than the mid-Mediterranean. The earliest known sail is found at Eridu in Mesopotamia in the late Ubaid period (mid-fourth millennium) and came into Upper Egypt with what Winkler calls the 'Eastern Invaders' before the end of the fourth millennium. About the same time, it came into Palestine, possibly from the south.[89] The spade-shaped paddle is not found in Mesopotamia before the 'Royal Graves' of Ur (about 2700 B.C.) but came into Upper Egypt with the sail and the 'Eastern Invaders,' and is found in Egypt in what Petrie called 'the oldest paintings known, at the beginning of the Amratian Age, painted in white lines on red pottery.' It remained common in Egypt down to at least the end of the Middle Kingdom (1786 B.C.).[90] These paddles and the sail moved into the Aegean

[88] This discussion has been simplified and shortened by omitting any reference to an earlier diffusion of ship construction using a hide-covered vessel, with an animal-head stem (and possibly stern) post, and steered from the port quarter. Such a vessel can be traced as far as India and Ireland in the period before the wooden-built diffusion discussed here. It is very possible that point 11 in this discussion (the bifid prow) diffused with the earlier skin boat rather than with the later plank boat.

[89] S. Lloyd and F. Safar, 'Eridu, 1947–1948,' *Sumer*, IV (1948), 115-125, pl. V (earliest sail); into Palestine in Ghassul period, see Petrie in *Egypt and the East* (December 1934), p. 118; into Egypt, see H. A. Winkler, *Rock Drawings of Southern Upper Egypt* (2 vols., London: Egypt Exploration Society, 1938–1939), *passim*, esp. pp. 26-27, 35-39, and pls. XXXVI and XXXIX; also H. J. Kantor, 'The Final Phase of Predynastic Culture,' *Journal of Near Eastern Studies*, III (1944), 110-136, at fig. 4F (late Gerzean sail). See, also, Childe, *New Light*, pp. 54, 78-80, esp. figs. 40, 115, and 129.

[90] Childe, *New Light*, pl. XXIVa ('Royal Graves'); Winkler, op. cit., pl. XXXVI, figs. 38 and 45; Petrie, 'Egyptian Shipping,' *Ancient Egypt and the East*, p. 12, fig. 47 (early Amratian); M. Raphael, op. cit., pl. XVII, fig. 1 (Amratian); H. E. Winlock, *Models of Daily Life in Ancient Egypt* (Harvard University Press, 1955), ch. IV, fig. 48 (Eleventh Dynasty); or J. H. Breasted, *Egyptian Servant Statues* (Washington: Bollinger Foundation, 1948), pl. 66 a-b.

area and to Crete by the late third millennium, but have not been traced further at this time.[91]

All northern, plank-built watercraft, including two from the Scandinavian Bronze Age and many from the Iron Age, have integral cleats and sewn seams; most have a bifid bow.[92] British remains, almost certainly from the Iron Age, have the same features. The sewing on one of these last vessels was done in a very distinctive fashion in which the sewing holes were concealed from sight within a dovetail seam. A similar method has been used in modern times on the Gujarati coast of India,[93] but, according to Hornell and Lallemand, this method was used in Dynastic Egypt.[94] Furthermore, the use of cleats to attach the strakes to inserted ribs has been found in modern times in the Far East, in the Moluccas, the Solomon Islands, and at Botel Tobago, near Formosa, where this feature was combined with oculi on both ends.[95] While we know nothing about the use of cleats or of inserted ribs on ancient Egyptian craft, Hornell offers some rather inconclusive arguments for inferring that they may have been used.[96] However, even if we reject these inferences, the known distribution of cleat construction and the similar distribution of hulls sewn by a distinctive stitch would seem to indicate that these methods originated at some more central point and must have passed across the central zone of this area (the Near East) before the plank-cutting saw or iron nails came into usage in this central zone.[97] This means that the diffusion in

[91] S. Marinatos, op. cit., pp. 170-235, pl. XVI, fig. 51-52 (lunar standards and sail), pl. XIII, fig. 12 (spade-shaped oar and solar disks; also in Childe, *Dawn of European Civilization*, fig. 24 on p. 50).

[92] A. W. Brøgger and H. Shetelig, op. cit., pp. 35-52; of one of the Bronze-Age vessels, Brøgger says, p. 36, 'We have here the genuine remains of a boat or rather a ship of the Bronze Age and probably from an early Bronze Age burial.'

[93] E. V. and C. W. Wright, 'Prehistoric Boats from North Ferriby, East Yorkshire,' *Proceedings of the Prehistoric Society*, 1947, pp. 114-138; Graham Clark, *Prehistoric England* (New York: Scribner, 1941), pp. 76-77.

[94] H. Lallemand, 'Les Assemblages dans la Technique Egyptienne,' *Bulletin de l'Institute Français de l'Archéologie Orientale*, XXII (Cairo, 1923), 77-98, at fig. 5; quoted by J. Hornell, 'The Sailing Ship in Ancient Egypt,' *Antiquity*, XVII (1943), 27-41, at p. 33-34.

[95] J. Hornell, 'Boat Construction in Botel Tobago,' *Man*, XXVI (1936), 145-147. The significance of the occurrence of sewn, cleated watercraft in both northwestern Europe and in Far Eastern waters was pointed out by Hornell many times, as J. Hornell, *Water Transport: Origins and Early Evolution* (Cambridge: University Press, 1946), pp. 199-213. Similar ideas, but emphasizing the bifid prow, in C. Nooteboom, *Trois Problèmes d'Ethnologie Maritime* (Rotterdam: Museum voor Landen Volkenkunde, 1952).

[96] J. Hornell, 'The Sailing Ship in Ancient Egypt,' at pp. 32-37.

[97] Six-inch iron spikes, presumably used in shipbuilding, have been found at the Israelite seaport of Ezion-Geber near Aqaba in a context dated toward the middle of the first millennium B.C. Since these are clearly not the earliest iron fastenings used for ships in that area, the earliest must be pushed backward in date toward the beginning of that millennium. The plank-cutting saw is even earlier in the Near East; in fact, the Egyptians were sawing planks for boat construction by the Fifth Dynasty, although the Egyptian method, for lack of large trees of hardwood, does not neces-

question crossed this central zone before the beginning of the Iron Age (say 1000 B.C.), although we cannot say how long before. In the west at least, the movement of the symbols we have discussed makes it seem likely that this diffusion of boatbuilding techniques went with the megalithic movement which would place it before 2000 B.C. for western Europe.[98] For the movement eastward we have much less to work with, for there is almost no evidence for prehistoric ships in that direction and the diffusion of symbols is not yet worked out. We cannot even say with confidence that these two diffusions went with the megalithic movement because in much of Asia this movement went by land rather than by sea. The chief exception to this last statement would be southern India where, as Childe has pointed out, the connection with the west seems to have been waterborne.[99]

All of this permits narrowing but not conclusive inferences on the arrival of the boat oculus in India. As we have seen, that country obtained the oculus and the oculus on a triangle as symbols in the third millennium B.C. The fact that India did not use boats or ships as cult objects would seem to indicate that they adopted the boat oculus as a decorative feature and not as part of a boat-cult complex.[100] This would seem to indicate that

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sarily imply that sawn planks were used where such trees were available. In view of Lethbridge's convincing remarks on the advantages of adz construction over sawn planks so long as integral cleats were used, it is very likely that sawn planks, although available, were not used until iron nails made it possible to eliminate cleats and sewing. See N. Glueck, *The Other Side of the Jordan* (New Haven: American Schools of Oriental Research, 1940), p. 110 (iron spikes and very large ropes); J. Hornell, *Water Transport: Origins and Early Evolution* (Cambridge: University Press, 1946), p. 48 (Fifth Dynasty saw); Lethbridge, op. cit., pp. 14-15.

[98] It should, perhaps, be pointed out that this megalithic movement was either Anatolian or Levantine originally (possibly both) and may later have been Cretan, but it could not possibly have been Egyptian since its chief contribution to northwestern Europe before 2000 B.C. was bronze and the chief motivation for the whole movement was a search for copper and tin, while Egypt itself did not enter the Bronze Age until the time of the Hyksos, in the seventeenth century B.C. See G. A. Wainwright, 'Egyptian Bronze-making,' *Antiquity*, XVII (1943), 96-98, or H. E. Winlock, *The Rise and Fall of the Middle Kingdom of Thebes* (New York: Macmillan, 1947), p. 162.

[99] See quotation from Childe at end of n. 85. On the megalithic movement in Asia being by land, see H. G. Quaritch Wales, op. cit., pp. 63-65, or R. von Heine-Geldern, 'Die Megalithen Südostasiens und ihre Bedeutung für die Klärung der Megalithen frage in Europe und Polynesien,' *Anthropos*, XXIII (1928), 276-315. Another difficulty is that the chronology of the Asiatic megalithic is both uncertain and protracted; Heine-Geldern, who would find its origin in the Mediterranean area, dates its first arrival in southeastern Asia and Indonesia to the period 2500–1500 B.C. (the same dates as its chief influence in northwestern Europe), but in many areas it continued down to modern times, and, in southern India seems to have flourished most vigorously in the last three centuries of the pre-Christian era; the famous Arrentine Roman pottery at Arikamedu was superimposed directly over a village using pottery of the South Indian megalithic type (Wheeler, *Rome Beyond the Imperial Frontiers*, p. 174).

[100] The extraordinary rarity of representations of boats in India and Arabia is conclusive evidence that there was no boat cult in those areas. In pre-Aryan India there are only two representations of boats, one on a seal and the other a casual scratching on a sherd. Mackay links these with the ships on the Gebel el Arak knife handle and the designs on early Sumerian seals or Gerzean pots, discerning such features as the sail, bipod mast, high stern, sewn hull, rectangular cabin, starboard steering, and vertical standards, one of which carries the 'harpoon sign.' See E. J. H.

it was obtained from a people who used it as a decoration (or amulet) rather than as part of a boat cult. If true, this would make it rather less likely that it was obtained from the Egyptians or most of the Mesopotamian peoples directly and rather more likely that it was obtained from the Semites. In the south the Semites, as we have seen, obtained the oculus with Egyptian features which could only have existed together in the third millennium B.C. While we cannot say with any assurance when the Indians obtained the boat oculus from the Semites, or even that they did obtain it from this source, the high antiquity of most of these diffusions makes it more likely that the trait was passed to the Indians in the second millennium rather than in the first millennium B.C. The only piece of evidence which might force the date down into the first millennium B.C., and not very far into it at that, rests in the fact that the earliest Indian boat oculus is found at both ends of the vessel, an innovation first found among the Phoenicians in the late second millennium B.C., so far as our evidence goes. The importance of this is strengthened by the fact that cleat-built boats in the Far East also used oculi at both ends. Moreover, there are other considerations. If the use of oculi at both ends in Zanzibar and the Comoro Islands is derived, as Hornell believed,[101] from Java, where the same feature is found in the Boro Budur sculptures dating about A.D. 800, this same usage at Ajanta in India about A.D. 600 could be regarded as evidence of the passage of this trait from the Semites who had this feature among the Phoenicians by 1200 B.C. Furthermore, the Ajanta oculus is anthropomorphic (and thus like the Egyptian) rather than geometric (like the Mesopotamian). If it could be shown that the anthropomorphic oculi of the Mediterranean, such as in Cyprus or among the Greeks or Etruscans,[102] were associated with Phoenician or earlier Canaanite traders

Mackay, op. cit., I, 189, 340-341; II, pl. LXXXIX, fig. A; and II, pl. LXIX, fig. 4. After the collapse of the pre-Aryan civilization, probably in the sixteenth century B.C., there seems to be no representation of a boat in India for over 1000 years. A similar situation exists in Arabia. Such a lack makes it very difficult to trace the diffusion of boat construction features across these vital areas, except by using the methods demonstrated in this paper. Commercial contact by sea, chiefly in Indian vessels, from India to Arabia and the Persian Gulf is established for most of the first millennium B.C. and is specifically mentioned by Agatharcides (second century B.C.) and by the *Periplus*; see Hornell in *Antiquity*, XV (1941), 248-250.

[101] J. Hornell, *Water Transport*, pp. 287-288. Hornell believes that the Javanese oculus was borrowed from a Chinese source because it takes the form of a round boss forming a protuberance. But the oculi at both ends of the Phoenician model boat mentioned in n. 66 also appears as protuberances. While this proves nothing, it does support the possibility that the oculus of the Far East came from a Semite source close to the Phoenicians.

[102] The evidence is confused and does not seem to support any final conclusion about the differential distribution of geometric and anthropomorphic oculi. In general it would seem that the earlier oculi in the west, including those of megalithic northwestern Europe were more likely to be geometric while later oculi in the Mediterranean were more likely to be anthropomorphic. Among the different peoples we have mentioned, Mesopotamian, Cretan, Mycenaean, Phoenician, Carthaginian, and early Greek oculi were usually or invariably geometric while Egyptian, Etruscan,

or that the use of oculi at both ends of watercraft in the Italian area came from a similar source, the argument for a Canaanite (proto-Phoenician) diffusion would be much strengthened.[103] At any rate, we can say with some assurance that the oculus as a symbol came to India in the third millennium B.C. and that the boat oculus came from some Semite peoples, either Arabs or Phoenicians, and did so in the second millennium, at any rate not later than about 850 B.C.

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and later Greek examples were usually anthropomorphic. But few generalizations can be made, and much very puzzling evidence exists. To mention but one example: the 'fringed edge' oculi found at Mohenjo-daro, as in n. 64, are also found, associated with ships, in the Danish Bronze Age as in *Revue Archaeologique*, XIII (1909), 332, fig. 16, or Moll, op. cit., pl. DIII, figs. 20, 21, 28, or 29.

[103] This argument would also be strengthened by a connection into which there is no space to enter here, namely the tradition that the Canaanites had a southern origin. To this I would like to add such evidence as the generally accepted idea that the trans-Jordan megalithic of the later third millennium B.C. had southern connections (as in N. Glueck, op. cit., pp. 115-124) or the rather speculative suggestions of Carl Rathjens (in 'Exploration au Yemen,' *Journal Asiatique*, CCXIV [1929], 141-155, at pp. 151-154), placing the proto-Phoenicians in Punt (=Punic) in Southern Arabia as a link between Egyptians and Indians in the third millennium B.C., and of J. Hornell ('Sea Trade in Early Times,' *Antiquity*, XV [1941], 233-256, at p. 235).

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American Steam Navigation in China, 1845-1878

PART VII

BY EDWARD KENNETH HAVILAND

XI. American Shipowners in the Philippines

WHILE American shipowners in the Philippines are not in general within the scope of the present paper, two of the most prominent firms at Manila, Russell and Sturgis (trading in China as Russell, Sturgis and Co.), and Peele, Hubbell and Co., have already been mentioned in connection with steam shipping on the coast of China and something should be said of those of their steamers which at some time operated in China or Japan. Russell Sturgis and Robert Shaw Sturgis were partners in Russell and Co. H. P. Sturgis, probably a connection, was registered owner of *Fernando de Norzagaray*, a steamer of 348 tons built at Brooklyn, New York, in 1858. She arrived at Shanghai from Manila on 28 December 1858 and on 15 January 1859 departed for Japan. Returning, she arrived at Shanghai on 28 February 1859 and left for Amoy on 16 March.[675] She was sold in 1860 to the French for use as a warship.

On 26 January 1866, Russell, Sturgis and Co. purchased the steamer *Feima* and placed her under the American flag, and on 10 February she left for Manila. *Feima* was a well-known vessel in the China coast and river trade. She was a wooden paddle steamer of 121 tons net and had been built by J. C. Cowper at Whampoa, being launched on 28 June 1856 and intended for Lyall, Still and Co.'s service between Hong Kong, Canton and Macao.[676] In the spring of 1862 *Feima* came to Shanghai and was advertised for sale.[677] Moses and Co. purchased her and ran her on the Ningpo route.

[675] *CRS*, Shanghai.
[676] *CM*, 3 July 1856.
[677] *NCH*, 12 April 1862.

The iron screw steamer *Albay*, 366 tons, built at Govan (Glasgow) in 1871, was first owned jointly by E. M. de Busscher and George Brown[678] who transferred her to Russell and Sturgis on 8 March 1872.[679] Her new owners employed her largely between China and the Philippines under the Spanish flag until she was wrecked in a typhoon at Hong Kong on 22 September 1874.[680] Subsequently she was raised and rebuilt and in 1877 returned to the British flag with Alfred Thomas Manger of Hong Kong as registered owner. On 24 August 1877 he sold the ship to John Stewart Lapraik, who owned her—latterly together with other owners—until she was transferred in 1883 to the Douglas Steamship Company, in which Lapraik was interested. They continued to operate *Albay* until she was wrecked near Swatow on 25 December of that year.[681]

Henry W. Hubbell, of Peele, Hubbell and Co., had a part interest in *Thames*, a wooden screw steamer of 614 tons, built in 1862 by George Greenman and Co. at Mystic Bridge, Connecticut, partly for their own account. Under Captain Devereux, she left San Francisco for Nagasaki on 22 July 1867 and was reported as at Nagasaki on 6 November 1867.[682] *Thames* must have returned to the United States before long, as she was surveyed at New York in February 1869. Her end came when she burned off Cape Hatteras, 4 June 1869, without loss of life.[683]

XII. Conclusion

With this account we end the history of American steam navigation in China. Its great days came to a close with the sale of the Shanghai S. N. Co.'s ships and properties in 1877, and a year or two later only *Pingan* of all the steamers trading on the coasts and rivers of China was flying the American flag. The flag reappeared during the Sino-French war of 1883 when the entire fleet of the China Merchants' S. N. Co. was transferred to Russell and Co. and placed under the American flag, but this was only a temporary measure (of uncertain legality) to protect the ships from capture, and on 31 July 1885 they reverted to their Chinese owners and flag. After that, there were from time to time American steamers in service in China, principally on the Yangtsze and notably those of the Standard Oil Co., the Dollar S.S. Co. and the Yangtsze Rapids S.S. Co., but they have

678 See under A. Heard and Co. above.

679 *BD*. *Albay* was apparently built for operation by Russell and Sturgis. See *The Artizan*, XXIX (1871), 142.

680 *NCH*, 8 October 1874.

681 *NCH*, 9 January 1884. *BD* says *Albay* was wrecked 20 December 1883.

682 *BSL*, 25 December 1867. *CRS*, Nagaski fails to confirm this.

683 *Lytle List*. *SBF*, June 1954.

not been numerous nor have they formed a substantial portion of the shipping engaged in those waters. Others, however, have been more tenacious and, although largely excluded from the coast and river trade of China under present conditions, a number of companies, including the China Navigation Co. (John Swire and Sons Ltd.), the Indo-China Steam Navigation Co. (Jardine, Matheson and Co.), and Reederei M. Jebsen A.G.[684] have sufficiently adapted themselves to changing circumstances as to be able to continue in the shipping business.

As one looks over the three and a half decades covered in the present paper, there emerge definite patterns, both of shipping and of ships. As to the former, one has to distinguish four periods. The first was the pioneering stage, lasting approximately through 1859, when the number of steamers was small and the routes not well developed and subject to frequent interruptions through hostilities of various sorts. Following the treaty of Peking in 1860 there came a period of relative stability along the coasts and principal rivers of China, of which an immediate result was a tremendous increase in the number of steamers trading and in the number of their operators. Much secondhand tonnage, some of it highly antiquated, appeared and competition was widespread and keen. For a while there was enough accumulated business for all and this activity reached its peak about 1862, but then trade not only shrank to its normal levels but also failed to exhibit the growth that had been expected of it. As a result there began around 1864 or 1865 a period of readjustment and rationalization. The larger ownerships became larger, while the smaller became smaller and often disappeared entirely. Complete monopoly obtained only on the Yangtsze and Ningpo routes and then not for long, but the powerful companies soon came to working agreements with one another. The fourth period may be said to have begun with the formation of the China Merchants' S. N. Co. in 1872, when native shipping enterprises became of importance, exhibiting a trend toward nationalism and self-sufficiency that had appeared in Japan a few years earlier and was appearing elsewhere in the world, notably in South America, and was to prove one of the factors which caused the virtual disappearance of the American flag from the river and coastal trade of the Far East.

Correspondingly, one can trace a development in the types of American ships in use in China. Aside from a few steamers for local service, the earlier American steamers on the China coast were really auxiliary sailing vessels, a type of ship enjoying considerable popularity at that time,

[684] See, e.g., 'Butterfield & Swire, 1867-1957,' *The Blue Funnel Bulletin*, January 1957; *'Jardines' and the Ewo Interests* (Jardine, Matheson & Co., Ltd.) (New York, 1947); E. Hieke, *Die Reederei M. Jebsen A.G., Apenrade* (Hamburg, 1953).

the thought being that they would combine the best features of both steam and sail. This hope, however, was not realized in practice, and this kind of ship, American or otherwise, had disappeared almost completely by the early 1860's. The steamers that followed them were typical American sound and coastwise steamers of the period. Particularly the former were greatly superior to their rivals both in ease and economy of operation and in cargo capacity, and they were largely responsible for the secure place that American steam shipping occupied in that part of the world. It is worth noting that Edward Cunningham thought of American steamers of the sort used on the western rivers as best adapted to the Yangtsze trade, but except for a few very small vessels they were never used. Conditions on the lower Yangtsze more nearly resembled those on the Hudson River and Long Island sound and the upper Yangtsze was not yet opened and western river steamboats of that period would probably not have been stout enough for service there anyway.

Well adapted as these American steamers had been to the coast and river trades of China when they first came out, it had appeared by the late 1860's that wooden hulls were not in general very durable nor beam engines and paddle wheels very efficient. A few of the wooden steamers had long lives, but the majority did not last more than eight or ten years, even if they escaped shipwreck or fire. Rotting of their timbers, often aggravated by strain from overloading, made many of the ships unseaworthy before long, and in the annual report of the S. S. N. Co. for 1873 the directors state that they 'have felt it their duty to order iron vessels to replace the wooden steamers as fast as the latter become unserviceable. They commend the same policy to their successors and believe that, by careful management, the change from wood to iron can be accomplished effectively and economically.' Iron steamers, however, could be built more cheaply in Britain than in the United States, with the result that nearly all the later American steamers in China were British built.[685] The river steamers, particularly, showed the influence of American design, and the iron screw steamers, both for coast and for river service, that came out in the 1870's established types that were not greatly modified down to recent years.

The American influence in steam navigation in China continued after the virtual disappearance of the flag not only in ship design but also in the work of numerous Americans who chose to remain in China, often

[685] Of those responsible for the Shanghai S. N. Co.'s policies, H. H. Warden was in later years the principal, if not the only, advocate of building the ships in America. See K.-C. Liu, *Steamship Enterprise in China, 1862-1877*, Chap. III, 'Six Years of "American Monopoly", 1867-1872,' (later referred to as III), pp. 38-39 (ms.).

for the remainder of their lives. Perhaps the most prominent and successful of these was H. B. Endicott, who, in 1873, left the employ of A. Heard and Co. to become the first Shipping Manager of the China Navigation Co. in Shanghai, a position in which he remained until his death at the age of seventy in 1894. Mr. A. V. T. Dean of Messrs. John Swire and Sons, Ltd., writes me that Endicott was a very competent man and that the China Navigation Co. owes much to him. The agreement of sale of the S. S. N. Co. provided that the China Merchants' S. N. Co. should take over the services of the Marine Superintendent of the former company, referring presumably to Miers Coryell, who, however, returned to America after a few years. In 1882 a Mr. Middleton, who had formerly been with the S. S. N. Co., became a responsible official (probably Marine Superintendent) of the Chinese company, a position he held for twenty-five years until his retirement in 1907.[686] A number of the S. S. N. and other American captains also went with the C. M. S. N. Co., including Andrews, Friend, Morse, Patterson, Paul, Pratt, Wells, Wilson and Winsor.

No one cause can be assigned to the disappearance of the American flag from Chinese waters, a disappearance which was essentially equivalent to that of the Shanghai S. N. Co. As of 1867, when competition with the S. S. N. Co. was about at a minimum, that on the Yangtsze was provided primarily by the Union S. N. Co., as already mentioned, and that on the Northern Route by Trautmann and Co., essentially a German company whose ships were operated under the British flag and were taken over in August 1868 by the newly formed North China Steamer Co., with Trautmann and Co. as general agents. Neither of these companies was very strong and the S. S. N. Co. could make working agreements with them on terms which left the American company in an overwhelmingly dominant position. This situation, however, could not and did not last and both competing services later fell into stronger hands. The Union Co.'s service on the Yangtsze was taken over by the China Navigation Co. in the spring of 1873, as has already been stated; while Jardine, Matheson and Co., who had entered the Northern Route in March 1869, took over the nearly bankrupt North China Steamer Co. in February 1871 and merged it into the China Coast S. N. Co. in January 1873.[687] Both the China Navigation Co. and the China Coast S. N. Co. had fleets, mostly of up-to-date vessels, about equal in number of ships and in tonnage to the S. S. N.

[686] See *Twentieth Century Impressions of Hong Kong, Shanghai and Other Treaty Ports of China* (Arnold Wright, Editor) (London, 1908), p. 466.

[687] Information regarding competition on the Northern Line is taken largely from K.-C. Liu, op. cit., III, 13-20 (ms.).

fleets on the corresponding lines, and in addition J. S. Swire in the latter part of 1874 acquired two seagoing steamers which he sent to China, thereby inaugurating a coastwise service allied to the China Navigation Co., although it was not merged into the latter until several years later. With these new British competitors the Shanghai S. N. Co. soon made very successful amicable working agreements, but by 1876 the competition, although friendly, was none the less formidable and real. Competition from the China Merchants' S. N. Co., which extended also to the Ningpo Line, was both less friendly and less formidable, but its importance was steadily growing.[688] To hold their own the Shanghai S. N. Co. had to employ British-built ships and man them with native crews and this aroused antagonisms in the United States which appear in the less friendly official climate, as reflected, for instance, in the consular regulations of 1874. All these circumstances must have helped the directors of the Shanghai S. N. Co. to decide to get out while the getting was good and this they did very skillfully, so that, as R. B. Forbes says,[689] 'The enterprise was completely wound up as a most successful speculation for all concerned.' But these words themselves suggest what was perhaps the deepest reason for the disappearance of American shipping in China. At this time the American West and Midwest were being opened up and it was to internal enterprises that Americans were turning and away from foreign lands and from the sea. They did not have the British or Scandinavian feeling for belonging on the sea. Navigation in the waters of China was a speculation, to be given up readily when better opportunities for profit arose at home. Nevertheless the chapter of steam navigation which they wrote in the years 1845-1878 is an important one and it has seemed desirable to collect the facts before they are lost. 'Quae jacerent in tenebris omnia, nisi litterarum lumen accederet.'

The author's interest in this subject was first aroused by the Potter photographs at the Peabody Museum of Salem and it was his friends there who first suggested that he follow up this interest by writing on the American steamers in China. This paper has been based very largely on material found at the Peabody Museum, the Essex Institute, the Mariners' Mu-

[688] K.-C. Liu, *The Creation of the China Merchants S. N. Co., 1872-1874*, especially p. 56 (ms.). See also Paper No. 5 of the 1956 Conference on the Chinese Economy, by the same author: *The Steamship Business in Nineteenth-Century China.*

[689] *Reminiscences*, 2nd ed., p. 367. Forbes is referring primarily to the original shareholders of the Shanghai S. N. Co., particularly the Americans. A further factor appears to have been the involvement of P. S. Forbes in the affairs of the short-lived China Transpacific S. S. Co. (see under A. Heard & Co., above), for which Russell and Co. had been appointed agents in China. As a result he was badly in need of cash, a need which, in part, at least, could be met by liquidation of the S. S. N. Co. (From notes furnished me by Dr. K.-C. Liu.)

seum, the National Archives, the Library of Congress, and the Baker and Widener Libraries of Harvard University, and the author takes pleasure in acknowledging the helpfulness of these institutions and the kind co-operation of their staffs.

Messrs. Matheson and Co., Ltd., and John Swire & Sons, Ltd., both of London, through Mr. Alan Reid and Mr. A. V. T. Dean respectively, have kindly furnished the author with interesting and useful information, which is much appreciated, as is the kindness of Mr. Elwin M. Eldredge of Clermont, New York, who from his extensive notes has made available information on the builders and dimensions of the engines of American-built steamers treated in the present paper. Finally, the author is especially indebted to Dr. K.-C. Liu of Harvard University who has generously shared his extensive knowledge of the affairs of the companies engaged in shipping on the Yangtsze and the North China coast in this period and in particular has made available copies of manuscripts not yet published.

APPENDIX I

Synopsis of Agreement of Sale of Property of Shanghai S. N. Co. to the China Merchants S. N. Co.[690]

1. The agreement is made by Russell and Co., subject to ratification by the shareholders of the Shanghai S. N. Co.

2. The Shanghai S. N. Co. is to sell and the China Merchants S. N. Co. to buy all steamers, floating and landed property, etc., of the S. S. N. Co. as of 31 December 1876 for Tls. 2,000,000.

3. The purchase money is to be paid as follows:

On or before the signing of the agreement:	Tls. 180,000;
On or before 31 January 1877:	220,000;
On or before 31 March 1877:	600,000;

the balance to be paid at the rate of Tls. 50,000 quarterly over five years.

4. The purchasers may forestall any payments.

5. Eight per cent interest shall be paid on the unpaid balance.

6. The property shall be at the risk of the purchasers from 1 January 1877.

7. Russell and Co. are to continue the working of the steamers and the business for the account and risk of the purchasers until 31 March 1877.

8. The purchasers are to have the management of the steamers and property after the payment of 31 March 1877.

9. The purchasers are entitled to have all steamers and property absolutely made over to them on payment of the whole purchase money, or such amounts of steamers and property as correspond to a fair equivalent of the purchase money paid.

10. The purchasers are to insure the steamers and property of which they have management but which have not yet been absolutely transferred.

11. The purchasers are to take over any leases of frontage, etc.

12. The purchasers are to take over the service of the Marine Superintendent of the S. S. N. Co.

13. The purchasers are not to run the purchased steamers on the south coast or between Hong Kong, Canton and Macao before certain dates, by agreements of the Shanghai S. N. Co. in 1867 with Jardine, Matheson and Co., Augustine Heard and Co., and the Hong Kong, Canton and Macao S. B. Co. (soon to expire).

14. The payment due 31 March may be made on 28 February and the purchasers thereby obtain the benefits due on the former date.

15. Provision for further agreements.

The foregoing is taken from *NCH*, 18 January 1877. At a special meeting of the S. S. N. Co. shareholders on 15 January 1877, at which 20,000 shares out of 22,500 were represented, the above proposal was accepted and the liquidation of the company assented to.

[690] *NCH*, 18 January 1877.

APPENDIX II

The Shanghai S. N. Co. Returns of Capital and Accumulations

Date	*Return*	*Rate*	*Amount*
6 March 1877	1st	Tls. 70 per share	Tls. 1,575,000
8 October	2nd	5	112,500
8 March 1878	3rd	5	112,500
8 April	4th	3	67,500
15 July	5th	2½	56,250
21 October	6th	2	45,000
15 January 1879	7th	2	45,000
9 April	8th	4	90,000
16 July	9th	2	45,000
20 October	10th	2	45,000
19 January 1880	11th	2	45,000
9 April	12th	3¼	73,125
9 July	13th	2	45,000
19 October	14th	2	45,000
1 June 1885	15th (final)	1	22,500
		107½	2,424,375

The final general meeting of the Shanghai S. N. Co. (in liquidation) was held on 18 May 1885. After taking into account the return of capital payable on 1 June, the final balance sheet, dated 2 May 1885, was as follows:

Dr.

Returns of capital and accumulation.	Tls. 2,424,375.00
Liquidation account.	557,200.83
	2,981,575.83

Cr.

Stock.	2,250,000.00
Insurance and depreciation fund.	615,902.35
Interest account.	115,673.48
	2,981,575.83

After payment of the fifteenth distribution there would remain Tls. 479.68, which Russell and Co. would hold in trust. This amount, together with anything realized from an *Alabama* claim of about $16,000 then pending, was eventually to be distributed to the stockholders of record 1 June 1885. Certain leases, whose existence had prevented the winding up of the company earlier, had by then expired. Accordingly, the directors resigned as of the close of the meeting, and on their recommendation the shareholders voted unanimously to bring the existence of the Shanghai S. N. Co. to a close.[691]

[691] *NCH*, 22 May 1885.

APPENDIX III

Technical Details of Steamers Mentioned in Text[692]

Name (Year Built)	Material	Type	Tonnage Gross	Tonnage Net	Hull Builder	Hull Dimensions	Engine Builder	Engine Type	Engine Dimensions
Abbotsford (1870)	Iron	scr.	1035.24	649.36	Blackwood	227.5 x 29.4 x 15.7	Blackwood	Cpd.	26", 46" x 36"
Acantha (1868)	Iron	scr.	1042.26	652.84	Lawrie	230.0 x 28.2 x 16.8	Blackwood	D. A.	48", 48" x 33"
Aegean (1870)	Iron	scr.	1112.84	836.45	London & G.	231.2 x 31.2 x 21.85	London & G.	Cpd.	31", 54" x 33"
Albay (1871)	Iron	scr.	584.59	366.23	Dobie	170.0 x 20.5 x 17.3	Howden	Cpd.	25", 45" x 30"
Alexander (1855)	Wood	scr.	428 80/95		Webb	159.6" x 23.1" x 12"	[illegible]	V. B.	26", 26" x 26"
Altona (1872)	Iron	scr.	1819.02	1185.20	Backhouse	280.0 x 35.0 x 24.5	Richardson	Cpd.	35", 67" x 36"
Anna (1859)	Wood	pad.	67 11/95		Ridcout	112'5" x 20'7" x 3'1"			
Antelope (1855)	Wood	scr.	415 9/95		Hall	155'6" x 26'11" x 10'6"	Tufts	I. B.	36", 30" x 26"
Ariel (1855)	Wood	pad.	1736.39		Simonson	252.0 x 32.0 x 20.8	Allaire	V. B.	75" x 132"
Arizona (1865)	Wood	pad.	2793.44		Steers	323.8 x 44.8 x 41.0	Novelty	V. B.	105" x 144"
Ashuelot (1863) [693]	Wood	scr.	323.19		Englis	138.0 x 29.2 x 11.6	Novelty	Osc.	36", 36" x 32"
Bellona (1872) [694]	Iron	scr.	1098	707	Denton	229.5 x 30.3 x 16.9	Richardson	Cpd.	27", 50" x 33"
Bengal (1853)	Iron	scr.	2036.11	1302.71	Tod	310.0 x 39.2 x 25.4	Tod	G. B.	80", 80" x 60"
						NE 72	Laird	Cpd.	44", 78" x 42"
Blythwoode (1870)	Iron	scr.	1214.48	770.46	Denton	230.0 x 32.0 x 17.2	Hawthorn	Cpd.	28", 56" x 36"
Bunker Hill (1861)	Wood	scr.	63 56/95		Boole	60'4.8" x 10'6" x 7'3"		D. A.	13", 13" x 15"
Cadiz. (1853)	Iron	scr.	815.94	481.14	Tod	220.4 x 28.4 x 18.0	Tod	T. G.	56", 56" x 48"
Capron (1872) [695]	Wood	scr.	374	136	Poillon	120.0 x 22.2 x 11.0	Delamater	D. A.	30" x 30"
						NE		Cpd.	19", 30½" x 30"
Carolina (1849) [696]	Wood	scr.	544 68/95		Birely	149.7 x 27.9 x 14.0	Reanie	D. A.	44", 44" x 36"
Chekiang (1862) [697]	Wood	pad.	1264 10/95		Steers	254'4" x 36' x 14'4"	Morgan	V. B.	70" x 132"
Chi Kiang (1862)	Wood	scr.	240 44/95		Jewett	101'4" x 22'10" x 11'5"	McLeod	Hor.	20", 20" x 24"
Chieftain (1859) [698]	Wood	scr.	722	389	Deptford	170.0 x 33.0 x 17.3	Maudslay	D. A.	45" x 24"
Chihli (1867)	Iron	scr.	1402.11	772.81	Napier	246.0 x 34.6 x 21.0	Napier	G. B.	
Chihli (1871)	Iron	scr.	1145.08	793.41	Inglis	212.6 x 33.5 x 18.8	Inglis	Cpd.	31", 60" x 36"
Chusan (1852)	Iron	scr.	699.87	529.01	Ravenhill	190.0 x 29.5 x 16.1		Osc.	39", 39" x 24"
Chusan (1866)	Wood	pad.	1633.93		Simonson	253.0 x 40.0 x 15.0	Delamater	V. B.	62" x 144"
Chusan (1874)	Iron	pad.	1381.13	953.43	Elder	300.9 x 50.2 x 10.0	Delamater	V. B.	62" x 144"
City of Exeter (1870)	Iron	scr.	1053.90	787.86	Pearse	228.2 x 29.25 x 17.15	Blair	Cpd.	28", 53" x 33"
Columbia (1850)	Wood	pad.	777 24/95		Westervelt	193' x 29' x 19'5"	Novelty	S. L.	57" x 60"
Confucius (1853)	Wood	pad.	468 6/95		Collyer	191' x 26'8" x 11'6"	Dunham	V. B.	50" x 120"
Consolation (1873)	Iron	scr.	1182.37	768.41	Aitken	242.0 x 30.5 x 22.4	Rait	Cpd.	30", 60" x 36"
Contest (1859)	Iron	scr.	522 80/95		Loring	140' x 25'10.8" x 14'8.4"	Loring	D. A.	38", 38" x 32"

Name (Year Built)	Material	Type	Tonnage Gross	Tonnage Net	Hull Builder	Hull Dimensions	Engine Builder	Engine Type	Engine Dimensions
Consolation (1873)	Iron	scr.	116.37		Loring	140 x 25 10.8 x 14 6.4			
Contest (1859)	Iron	scr.	522 80/95						
Cortes (1852)	Wood	pad.	1117 38/95		Westervelt	220'6" x 32.6" x 16'10"	Morgan	V. B.	42", 42" x 120"
Costa Rica (1863)	Wood	pad.	1917.43		Simonson	269' x 38'10" x 27'	Allaire	V. B.	84" x 144"
Courier (1866) [699]	Iron	scr.	628	499	Henderson	162.0 x 25.3 x 21.7		Cpd.	31", 53½" x 33"
Craigforth (1869)	Iron	scr.	1109.45	862.82	London & G.	230.7 x 31.25 x 21.8	London & G.	Osc.	36" x 33"
Cuyahoga (1854) [700]	Wood	scr.	395.89		Westervelt	152.0 x 27.7 x 13.1	Faron	D. A.	32", 32" x 26"
Dai Ching (1862)	Wood	scr.	728.89 95		Jewett	175'2" x 29.8" x 14'10"	McLeod	D. A.	32", 32" x 26"
Dang Wee (1861)	Wood	scr.	507		Englis	158' x 28' x 12'	Novelty	D. A.	30", 36" x 18"
Diana (1823) [701]	Wood	pad.		86	Kyd	69.6 x 16.8 x 8.3	Maudslay	2 cyl.	
Duna (1871)	Iron	scr.	1320.02	852.38	Aitken	260.7 x 30.7 x 23.05	Tennant	Cpd.	28", 50" x 30"
Edith (1844)	Wood	scr.	407 15/95		Hall	121' x 26'3" x 14'	Hogg		
Elfin (1862)	Wood		79		Collyer & L.				
Elfin (1873) [702]					Farnham				From *Elfin* (1862)
Enterprise (1861)	Wood	pad.	230 48/95	107	Owens	134'2" x 27'7" x 6'9"			
Erl King (1865)	Iron	scr.	1344.19	1044.31	Inglis	250.0 x 34.5 x 21.7	Inglis	D. A.	50", 50" x 42"
	L 74. Cpd. 74 NE 81		2178.11	1706.98	—	305.6 x 34.1 x 28.3	Thomson	Cpd.	2[illegible]
						222.5 x 30.15 x 10.4	Rollo	Cpd.	30", 70" x 48"
Express (1861)	Iron	pad.	489.75	290.55	Williams	168'10" x 29'8" x 14'10"	Pusey	D. A.	42", 42" x 42"
Fahkee (1863) [703]	Wood	scr.	699 57/95		Clover	69.1 x 15.4 x 7.5	Jno. Jones	D. A.	44", 44" x 40"
Fairy (1870)	Iron	scr.	44.40	6.11	Boyd	84.9 x 15.6 x 7.4	Boyd	Cpd.	16", 27" x 16"
	L 87. NE 87		71.96	14.47	Cowper	158.0 x 18.0 x 8.2	Thomson, J. & G.	St.	
Feima (1856)	Wood	pad.	192.54	121.30	Vernon	157.8 x 19.3 x 11.1	Forrester	S. L.	41", 41" x 42"
Fenella (1850)	Iron	pad.	252.94	170.19					
Fernando de Norzagarey (1858)	Wood	scr.	348 91/95		Sneden	141' x 26'6" x 10'			26", 26" x 26"
Fire Cracker (1862) [704]	Wood	pad.	1040 12/95		Englis	250'4" x 36' x 12'	Neptune	V. B.	60" x 144"
Fire Dart (1860)	Wood	pad.	678 47/95		Collyer	200'9" x 30'6" x 11'7"	Neptune	V. B.	46½" x 144"
Fire Queen (1864) [705]	Wood	pad.	3801.19	2886.01	Englis	317.4 x 47.0 x 14.0	Allaire	V. B.	86" x 144"
Flambeau (1861) [706]	Wood	scr.	766.96		Lawrence	173.5 x 31.2 x 18.1	Essler	G. B.	50" x 66"
Fohkien (1863)	Wood	pad.	1947 11/95		Steers	279' x 38' x 19'	{Allaire} [702] {Morgan}	V. B.	81" x 144"
Fokelin (1863)	Iron	scr.	73.57	41.02		99.5 x 16.6 x 8.7			
Forbes (1829)	Wood	pad.	302 48/94	161 92/94	Howrah	126'10" x 22'6" x 13'8"	Boulton	2-cyl.	—" x 48"
Fuhle (1870)	Iron	scr.	100.94	37.55	Irvine	95.2 x 18.1 x 9.1	Joy	D. A.	21", 21" x 18"
Fung Shuey (1864) [707]	Wood	scr.	1004 16/95		Whitlock	195'6" x 35' x 24'	Delamater	D. A.	44" x 42"
Fusiyama (1862)	Iron	scr.	968.77	744.51	Pearse	214.3 x 29.2 x 20.5	Fossick	D. A.	45", 45" x 30"
	NE 74						Samuelson	Cpd.	27", 50" x 33"
Fusiyama (1863) [708]	Comp.	pad.	1215		Collyer & L.	270 x 37 x 11	Neptune	V. B.	66" x 144"

Name (Year Built)	Material	Type	Tonnage Gross	Tonnage Net	Hull Builder	Hull Dimensions	Engine Builder	Engine Type	Engine Dimensions
Fychow (1866)	Wood	pad.	1633·93		Simonson	253 x 40 x 15	Fletcher	V. B.	62" x 144"
Ganges (1859) [709]	Iron	pad.	1189·58	742·30	Tod	235·3 x 29·4 x 18·4	Tod	S. I.	77", 77" x 78"
General Ward (1863)	Wood	scr.	70 56/95		Boole	65·8 x 16·7 x 7·2			
Glendarroch (1871)	Iron	scr.	1509·37	954·39	Stephen	272·3 x 33·1 x 24·2	Thomson, J. & J.	Cpd.	34", 60" x 36"
Glengyle (1864)	Iron	pad.	1933·28	1205·52	Denny	297·3 x 38·3 x 14·8	Denny & Co.	Incl.	58", 58" x 108"
Golden Age (1853)	Wood	pad.	1869·56		Brown	272'10" x 41'10" x 25'1"	Morgan	V. B.	83" x 144"
Governor General (1848)	Wood	pad.	761 65/95		Webb	209 x 30 x 12	Secor	V. B.	54" x 132" [710]
Hangchow (1863)	Wood	pad.	2024·54		van Deusen	252·5 x 39·6 x 17·1	Etna	V. B.	60" x 120"
Hankow (1860)	Wood	pad.	725 87/95		Collyer	213'6" x 30'6" x 11'7"	Morgan	V. B.	48" x 144"
Hellespont (1849) [711]	Iron	scr.	445·30	330·50	Mare	174·5 x 24·4 x 14·5	Maudslay	I. D. A.	36", 36" x 24"
Hirado (1865)	Comp.	pad.	1294		Collyer & L.	265 x 36 x 10·6	Neptune	V. B.	60" x 144"
Hoquang (1861)	Wood	pad.	1055			200' x 33' x 11'6"		V. B.	50" x 132"
Honan (1871) [712]	Iron	pad.	566	339	S. S. N.	218·0 x 31·2 x 9·0			50" x 96"
Hong Kong (1849)	Wood	pad.	232·3	140·7	Pitcher	133·0 x 18·0 x 11·55	Harman		38", 38" x 39'
Honque (1868)	Wood	pad.	665		Roberts	155 x 26 x 17	Rodman		
Howquah (1863)	Wood	scr.	397 49/95		B. & B.	126·0 x 23·6 x 14·3		D. A.	36" x 36"
Hupeh (1870)	Iron	pad.	2745·79	2006·18	Inglis	277·2 x 42·3 x 14·25	Inglis	V. B.	66¼" x 144"
						Rebuilt		Cpd.	29", 57¾" x 144"
Huquang (1862) [713]	Wood	pad.	1339 91/95		Steers	280'4" x 36' x 15'8"	Allaire	V. B.	76" x 144"
John S. Williams (1862)	Wood	scr.	161 19/95		Lawrence	92' x 19' x 6'	Neptune	D. A.	28" x 28"
John T. Wright (1860)	Wood	pad.	369 73/95		Hammond	168' x 26'8" x 8'8"	Rodman		
Kaga-no-kami (1861)	Wood	scr.	338·39		Sampson	158·9 x 27·9 x 12·0	Atlantic	Hor.	30", 30" x 18"
Kankakee (1863)	Wood	scr.	313·59		Westervelt	137·9 x 29·2 x 11·6	Gray	Osc.	2-cyl.
Kewanee (1861)	Wood	scr.	236·59		Robb	141·0 x 27·2 x 11·2			
Kiang Loong (1862)	Wood	pad.	945 26/95		Englis	270'8" x 39'7" x 10'3"	Neptune	V. B.	72" x 144"
					Erected by Thomas Hunt & Co., Whampoa				
Kiangse (1862) [714]	Wood	pad.	1086 20/95		Lawrence	204' x 33'6" x 16'9"	Essler	V. B.	50" x 132"
Kiangsoo (1862)	Wood	scr.	240 44/95		Jewett	101'4" x 22'10" x 11'5"	McLeod	D. A.	22", 22" x 20"
Kinshan (1863)	Wood	pad.	1722	1381	Roosevelt	234·4 x 35·4 x 11·8		V. B.	56" x 120"
Kiukiang (1863)	Wood	pad.	1065 11/95		Englis	243'6" x 36' x 12'8"	Allaire	V. B.	58" x 12'
Kiushiu (1862)	Iron	scr.	839·35	684·99	Robinson	199·9 x 27·8 x 19·0		Cpd.	24", 41" x 30"
Kuroda (1872) [715]	Wood	scr.	644	386	Poillon	194·3 x 26·7 x 16·9	Delamater	Cpd.	24", 42" x 34"
Kwangchow (1871)	Iron	scr.	1335·39	864·11	Denny	271·3 x 30·1 x 22·6	Denny & Co.	Cpd.	34½", 60" x 36"
Laptek (1872)	Iron	scr.	734	462	Jackson	189·0 x 25·0 x 19·7	Almond	Cpd.	16", 32" x 36"
Lily (1856)	Wood		413		Cowper	179 x 22 x —			
Lotus (1861)	Iron	scr.	594·99	461·42	Henderson	202·0 x 27·1 x 15·2			
			{ 669·33	{517·47		{220·2 x 29·1 x 14·9			
Luzon (1864) [716]	Iron	scr.	}1006	}743	Blackwood	}219·9 x 28·2 x 14·8	Blackwood	Cpd.	27", 50⅜" x 26"

Name (Year Built)	Material	Type	Tonnage Gross	Tonnage Net	Hull Builder	Hull Dimensions	Engine Builder	Engine Type	Engine Dimensions
Maggie Lauder (1863)	Iron	scr.	129.68	68.90	Miller	90.4 x 20.7 x 9.5			
Manchu (1866)	Wood	scr.	805.63		Mallory	195.4 x 37.0 x 17.0	Delamater	D. A.	30", 30" x 34"
Mars (1862)	Iron	scr.	1021.46	679.44	Mare	261.6 x 31.3 x 21.1	Mare[717]	D. A.	58", 58" x 48"
Martin White (1854) [718]	Wood	scr.	189 31/95		Birely	92' x 23' x 10'	Reany	D. A.	24", 24" x 24"
Mary A. Boardman (1862)	Wood	scr.	483 2/95		Englis	154' x 27' x 12'4"	Neptune	D. A.	26", 26" x 26"
Mecca (1872)	Iron	scr.	1066.90	686.81	Osbourne	220.8 x 30.0 x 16.6	Samuelson	Cpd.	27", 50" x 33"
Meteor (1850)			136.57	86.04		105.9 x 17.6 x 8.6			
Meteor (1864)	Wood	scr.	1221.15		Tobey	255.5 x 34.8 x 16.8	Greenock	D. A.	62", 62" x 36"
Midas (1844)	Wood	tw. scr.	186 13/95		Hall	100' x 21'7" x 9'5"	Hogg		
Milbanke (1868)	Iron	scr.	1296.13	843.11	Oswald	234.3 x 31.1 x 17.6	Clark	D. A.	45", 45" x 30"
Millet (1869) [719]	Iron	scr.	504.82	181.61	Inglis	120.2 x 30.15 x 10.7	Inglis	D. A.	24", 24" x 21"
Min (1856) [720]	Iron	scr.	192	130	Denny	125.0 x 21.0 x 12.0	Tulloch	S. T. G.	{41¼", 41¼" x 33" Trunk 18"
Mississippi (1854)	Wood	pad.	2026 26/95		Edwards	285' x 38'4" x 14'	West Point	V. B.	70" x 144"
Moyune (1863)	Wood	pad.	1223 81/95		Englis	254'6" x 38'8" x 13'	Neptune	V. B.	65" x 150"
Mona (1863)	Iron	scr.	693.05	542.21	Backhouse	188.7 x 28.3 x 17.3			
Mongol (1873)	Iron	scr.	2259.55	1463.65	Dobie	300.5 x 35.4 x 31.2	Howden	Cpd.	48", 90" x 48"
Mowtan (1869) [721]	Comp.	scr.	673	448	Laing	190.6 x 26.1 x 13.4		Cpd.	25", 44" x 33"
Nanking (1873)	Comp.	pad.	2330	1468	Rowland[722]	295.5 x 50.0 x 11.5	Morgan	V. B.	80" x 132"
Nevada (1865)	Wood	pad.	2143.82		Simonson	281.0 x 40.0 x 16.3	Morgan	V. B.	85" x 144"
New York (1865)	Wood	pad.	2217.00		Simonson	292.6 x 41.7 x 26.5	Allaire	V. B.	90" x 144"
Niphon (1863)	Comp.	scr.	399.58		Atlantic	154.0 x 24.9 x 16.0	Atlantic	D. A.	26", 26" x 26"
Oregonian (1866)	Wood	pad.	1914.45		Lawrence	275.5 x 42.4 x 21.3	Allaire	V. B.	82" x 144"
Oriflamme (1863)	Wood	pad.	1204 73/95		Lawrence	227' x 33'3" x 19'	Neafie	V. B.	60" x 120"
Paokong (1875)	Iron	pad.	733	557	Farnham	158.0 x 28.0 x 15.6			
Paouting (1873)	Stl. & Irn.	scr.	1061.37	640.59	Elder	211.0 x 33.0 x 13.0	Elder	Cpd.	32", 62" x 33"
Pawtuxet (1864)	Wood	scr.	230.80			143' x 26'6" x 11'6"		Osc.	36", 36" x 30"
Paysan (1856)	Wood			47	Ross	103' x 12' x —			
Peiho (1858)	Wood	pad.	1113 18/95		Collyer	225'9" x 32' x 16'1"	Morgan	Osc.	52" x 96"
Peiho (1866)	Iron	scr.	137.12	70.31	Reiherstieg	95.0 x 17.0 x 11.6 NE	Boyd	Cpd.	14", 28" x 28"
Pembroke (1860)	Iron	scr.	241 16/95		Atlantic	113'6" x 24'8.4" x 9'4.8"	Atlantic	V. B.	26" x 36"
Perusia (1857) [723]	Iron	scr.	2017.79	1143.40	Tod	301.0 x 41.3 x 19.5	Tod	Trunk	85½", 85½" x 54"
	L69	NE69	3452.41	2203.09		352.6 x 41.5 x 19.15 NE 74	Tod	D. A.	72", 72" x 45"
							Rankin	Cpd.	57", 95" x 45"
Pingon (1865)	Wood	scr.	549.76		Cramp	169.8 x 27.5 x 17.0	Neafie	D. A.	36" x 34"
	L73		806		Boyd	219.0 x 26.8 x 16.6			

Name (Year Built)	Material	Type	Tonnage Gross	Tonnage Net	Hull Builder	Hull Dimensions	Engine Builder	Engine Type	Engine Dimensions
Pluto (1863)	Wood	scr.	202 42/95		Englis	97′ x 20′8″ x 11′	Dillon	D. A.	22″ x 22″
Plymouth Rock (1863) [705]	Wood	pad.	3017.32	2379.96	Westervelt	284.0 x 41.6 x 14.5	Allaire	V. B.	81″ x 144″
Poyang (1861) [724]	Wood	pad.	827 84/95		Roosevelt	233′ x 31′ x 11′10″	Allaire	V. B.	50″ x 144″
Promise (1863)	Wood	scr.	590 42/95		van Deusen	156′6″ x 30′ x 13′6″	Dillon	D. A.	26″, 26″ x 26″
Rajah (1853) [725]	Iron	scr.	537.08	419.04	Mare	163.6 x 24.0 x 16.7	Watt	Tr. G.	39″, 39″ x 27″
			506.57	364.02		169.6 x 25.8 x 16.9			
Relief	Iron	scr.	791.45						
River Bird (1854)	Wood	pad.	527 38/95		Sneden	174′ x 30′8″ x 10′6″	Fulton	V. B.	40″ x 120″
Rocket (1869)	Iron	scr.	76.01	17.47	Hornby	85.6 x 17.0 x 9.2	Marshall	D. A.	18″, 18″ x 18″
Rona (1862) [726]	Iron	pad.	1215.42	784.30	Denny	235.0 x 33.2 x 21.3	Denny & Co.	Diag.	46″, 46″ x 108″
Rover (1863)	Iron	tw. scr.	496.17			179.0 x 23.3 x 19.1		D. A.	(2) 26″, 26″ x 20″
Santa Cruz (1857) [727]	Wood	scr.	349 87/95		Collyer	131′10″ x 26′ x 11′	Neptune	D. A.	26″, 26″ x 26″
Scotland (1856)	Iron	scr.		759.32		210.7 x 32.9 x 19.8			
Shaftesbury (1862)	Iron	scr.	680.86	524.17	Oswald	200.0 x 28.7 x 16.8	Richardson	D. A.	42½″, 42½″ x 24″
			1031	744	(after rebuilding)				
Shanse (1862)	Wood	scr.	1006 71/95		Lawrence	206′ x 32′ x 16′	Fletcher	C. B.	50″, 50″ x 72″
Shantung (1861) [728]	Wood	pad.	361 16/95		Collyer	150′ x 25′ x 10′2″	Neptune	V. B.	36″ x 120″
Shantung (1870)	Iron	scr.	1520.24	907.60	Inglis	216.8 x 39.2 x 16.4	Inglis	Cpd.	24″, 46¼″ x 36″
Shingking (1873)	Iron	pad.	1249.27	710.79	Inglis	219.2 x 33.0 x 18.2	Inglis	V. B.	56″ x 144″
L and NE		scr.	1378	869		244.0 x 33.0 x 18.2	Laird	Cpd.	36″, 62″ x 39″
NE		scr.					Lees	T. E.	20″, 32″, 52″ x 39″
Sir George Grey (1859)	Iron	scr.		506	Reiherstieg				
Soochow (1858)	Iron	tw. scr.	447.45	318.18	Robinson	162 x 25 x 15	Inglis	Cpd.	(2) 27″, 49″ x 30″
	NE 74						Howden	D. A.	34″, 34″ x 27″
Soochow (1865) [729]	Iron	scr.	504.01	354.62	Hedderwick	180.2 x 25.8 x 15.1			
Spark (1850)	Wood	pad.	133.34	86.54		128.0 x 17.5 x 6.6	McDougal	Incl.	36″, 36″ x 72″
Spec (1862)	Comp.	pad.	130.46	89.23	McDougal	130.0 x 18.8 x 8.0	Tod	Cross.	74½″, 74½″ x 72″
Sultan (1847)	Iron	pad.	1090.33	728.76	Tod	224.2 x 29.1 x 17.8	Caird	Tr.	42″, 42″ x 48″
L and NE. 1855		scr.	1124.7	808.8		231.0 x 32.0 x 17.8	Howden	Cpd.	30″, 60″ x 39″
Sunfoo (1871)	Iron	scr.	1449.66	918.33	Stephen	264.1 x 33.1 x 24.3			
Surprise (1853)	Wood	pad.	456 50/95		Lawrence	181′1″ x 27′9″ x 9′6″	Neptune	V. B.	76″ x 144″
Suwonada (1864)	Wood	pad.	1802 44/95		Englis	258′ x 38′2″ x 21′2″	Essler	C. B.	50″, 50″ x 72″
Szechuen (1862) [730]	Wood	scr.	1006 71/95		Lawrence	206′ x 32′ x 16′	Neptune	V. B.	80″ x 144″
Szechuen (1875)	Iron	pad.	1242	806	Elder	327′ x 50′ x 13′	Dickson	D. A.	36″, 36″ x 44″
Takiang (1862) [731]	Wood	scr.	609 43/95		Roosevelt	164′6″ x 28′ x 14′			
Ta Yung (1858)	Iron	pad.	124.70	49	Tod	109.4 x 18.6 x 9.3			
Tah Wah (1862)	Wood	pad.	590		Sneden				

			Tonnage		Hull		Engine		
Name (Year Built)	*Material*	*Type*	*Gross*	*Net*	*Builder*	*Dimensions*	*Builder*	*Type*	*Dimensions*
Tartar (1873)	Iron	scr.	2254.50	1467.77	Dobie	300.3 x 35.4 x 24.2	Howden	Cpd.	48″, 90″ x 48″
Thales (1864)	Iron	scr.	1198.78	819.89	A. Denny	231.0 x 31.4 x 23.0	Denny & Co.	D. A.	50″, 50″ x 42″
	Engines compounded by Hong Kong Dock Co., in 1880								30″, 51″ x 42″
Thames (1862) [732]	Wood	scr.	644 77/95		Greenman	150′ x 30′6″ x 13′6″	Delamater	D. A.	34″ x 30″
Tokei Maru (1852)	Wood	pad.	1423 44/95		Perine	235′6″ x 35′8″ x 22′	Allaire	S. L.	66″ x 132″
Touitia (1862) [732]	Wood	scr.	379 43/95		Collyer	139′4″ x 26′7″ x 10′2″	Neptune	D. A.	26″, 26″ x 26″
Trafalgar (1871)	Iron	scr.	1513.90	973.60	Mitchell	248.3 x 32.3 x 24.6	Maudslay	Cpd.	29″, 56″ x 33″
Tsatlee (1862)	Wood	pad.	80 23/95			85′ x 15′6″ x 6′6″			
Tunsin (1863)	Iron	pad.	773.51	610.94	Samuda	241.3 x 26.0 x 12.8	Penn	Osc.	46″, 46″ x 50″
Underwriter (1854)	Wood	scr.	433 60/95		Cramp	135.4 x 27.0 x 12.8	Sutton	Osc.	46″ x 54″
Unicorn (1836) [733]	Wood	pad.	649	390	Steele	163 x 23 x 17	Caird	S. L.	57″, 57″ x 66″
			786.21	593.13		165.6 x 22.8 x17.6			
Union (1854)	Comp.	scr.	307.44	204.88	Samuda	163.7 x 22.0 x 14.0			
		NE					Farnham	Cpd.	20″, 36¼″ x 27″
Union Star (1861)	Wood	scr.	163 10/95		Liquori	112′ x 24′6″ x 6′6″			
United Service (1857)	Iron	scr.	1128.00	725.47	Laing	218.1 x 31.0 x 18.2	Mare	Osc.	56″, 56″ x 44″
		L	1459	955.50		263.4 x 31.3 x 17.9			
Vancouver (1874)	Iron	scr.	2922.97	1987.62	Henderson	249.6 x 37.0 x 31.9	Henderson	Cpd.	54″, 102″ x 54″
Varuna (1863)	Wood	scr.	867.37		Mallory	188.5 x 33.0 x 20.0	Delamater	D. A.	36″, 36″ x 36″
Vasco de Gama (1873)	Iron	scr.	2912.43	1980.45	Henderson	349.4 x 37.0 x 31.8	Henderson	Cpd.	54″, 102″ x 54″
Venus (1862)	Iron	scr.	1022.63	677.44	Mare	261.6 x 31.3 x 21.1	{Mare—designed} {by Harrington	D.A.	58″, 58″ x 48″
			1373	928 [734]		250.0 x 31.2 x 27.5			
Vulcan (1863)	Wood	scr.	366 26/95		Englis	131′8″ x 24′10″ x 12′	Dillon	D. A.	26″ x 26″
Washington (1844)	Iron	pad.	193.81	85.85	Maxton	121.3 x 20.0 x 11.6			
Washington (1854)	Wood	pad.	435 91/95		Crawford	136′4″ x 32′2″ x 11′	West Street	Incl.	38″ x 108″
Rebuilt at Boston, 1864			618 3/95			186′ x 32′ x 11′			
White Cloud (1859)	Wood	pad.	520 51/95		Collyer	182′ x 29′1″ x 10′4″	Morgan	V. B.	44″ x 120″
Willamette (1849)	Iron	scr.	370 46/95		Harlan	155.6′ x 28.2′ x 9.0′	Harlan		
William Miller (1869)	Iron	scr.	888.64	566.92	Elder	215.8 x 27.7 x 20.5	Elder	Cpd.	25″, 50″ x 30″
Woosung (1864)	Wood	tw. scr.	161 3/95		Boole	90.2 x 20.2 x 9.7			
Yangtsze (1857) [735]	Wood	pad.	1003 10/95		Collyer	203′6″ x 32′2″ x 16′1″	Morgan	Osc.	38″, 38″ x 96″
Yangtsze (1868)	Wood	pad.	1187		Batchelder	260′ x — x —	Secor	V. B.	52″ x 132″
Yesso (1864)	Wood	pad.	973.16	559.87	Simonson	200.0 x 36.0 x 21.0	Neptune	V. B.	80″ x 144″
Yung Hai An (1855) [736]	Iron	scr.	605.55	449.38	Napier	235.4 x 30.8 x 23.1	Napier	P. D.	56 3/16″, 56 3/16″ x 36″
Yungching (1872)	Iron	scr.	1035.46	661.20	Humphreys	230.7 x 30.0 x 16.15	Humphreys	Cpd.	30½″, 56″ x 33″

692 Information has been taken from official documents, American or British, wherever possible, and material from these sources is characterized by the use of fractional tonnages. It has not been thought desirable to give all changes in tonnages or dimensions, since these changes are often slight, those data being preferred which are applicable as near as possible to the time when the steamer was in American service in China. When documents are not available, the source for dimensions, tonnages and builders is usually indicated, *Lloyd's Register* being preferred, the data there being probably as accurate as the official figures although not always based on the same rules. Information regarding machinery is not in general given in official documents of this period and has mostly been obtained from *Lloyd's Register* or *Underwriters' Register for Iron Vessels*. Some (but not necessarily all) other sources of information are given in footnotes.

693 See *Harper's Magazine*, LXV (1882), 232.

694 *Lloyd's Register*, 1876-1877.

695 *Lloyd's Universal Register*, 1886-1887.

696 See also *JFI*, XLVIII (1849), 332-333.

697 See also *JFI*, LXXV (1863), 380.

698 *BVRG*, 1872. See also T. J. Main and T. Brown, *The Marine Steam Engine* (Philadelphia, 1864).

699 *Lloyd's Register*, 1869-1870.

700 See also *JFI*, LVIII (1854), 139; *The Artizan*, XII (1854), 287.

701 The dimensions are those of the new hull, constructed in Calcutta. The English frame of oak, which Mr. J. T. Robarts, the owner, had had sent to China early in 1822, but which—because of his poor health—he did not erect there, was, on its arrival in India, not considered sufficiently durable for use. See G. A. Prinsep, *An Account of Steam Vessels and of Proceedings connected with Steam Navigation in British India* (Calcutta, 1830), p. 3. This gives the tonnage as 132 92/94 g., 89 79/94 n.

702 *NCH*, 12 July 1873.

703 See also *JFI*, LXXV (1863), 376.

704 See also *JFI*, LXXV (1863), 343.

705 Data taken from her British document, when she was registered at St. John.

706 See also *JFI*, LXXV (1863), 43-44.

707 See also *NYH*, 14 February 1864.

708 Data from Endicott lithograph.

709 See also *The Artizan*, IX (1851), 44.

710 The diameter of the cylinder is also given as 52".

711 See also *The Artizan*, IX (1851), 237.

712 *Lloyd's Register*, 1914-1915.

713 See also *JFI*, LXXV (1863), 176.

714 See also *JFI*, LXXV (1863), 178.

715 *Lloyd's Universal Register*, 1886-1887.

716 The second set of tonnages and dimensions is taken from *Lloyd's Register*, 1893-1894, and probably reflects the addition of upper works.

717 Designed by T. Harrington.

718 See also Reany, Neafie & Co.'s Record Book, 1849-1864 (at Mariners' Museum).

719 From information kindly supplied by Messrs. A. & J. Inglis.

720 From information and engine plans kindly supplied by Messrs. Wm. Denny & Bros.

721 *Lloyd's Register*, 1869-1870, 1914-1915.

722 Iron frames only. They were set up and planked by the S. S. N. Co. at Hongkew. Dimensions and tonnages are taken from *Lloyd's Register*, 1893-1894. The engine, which had come from *Chekiang*, was rebuilt by M. Coryell.

723 See also *Practical Mechanic's Journal*, 2nd Ser., II, 248.

724 See also *JFI*, LXXV (1863), 173.

725 The first set of dimensions and tonnages are as of 1853; the second as of 1865.

726 See also *The Artizan*, XX (1862), 93.

727 See also *The Artizan*, XIV (1856), 255.

728 See also *JFI*, LXXV (1863), 43.

729 See also *The Artizan*, XXIII (1865), 165.

730 See also *JFI*, LXXV (1863), 378.

731 See also *JFI*, LXXV (1863), 342.

732 See also *JFI*, LXXV (1863), 346.

733 See also H. P. Spratt, *Transatlantic Paddle Steamers* (Glasgow, 1951), pp. 37-38. The second set of data is from her registration at Sydney in 1854.

734 These figures are taken from *URIV*, 1874-1875. They probably correspond to the addition of upper works or deckhouses.

735 See also *JFI*, LXXI (1861), 167.

736 See also R. Murray, *Rudimentary Treatise on the Marine Engine and on Steam Vessels and the Screw* (London, 1858), Appendix.

Further comments on steamers in Appendix III: There is some indication that *Anna* may have had a stern wheel. *Laplek* was consigned occasionally, but not regularly, to A. Heard & Co.

Full names and locations of ship and engine builders

Aitken	Aitken & Mansel, Whiteinch
Allaire	Allaire Works, New York
Almond	W. & J. Almond, North Shields
Atlantic	Atlantic Works, East Boston
Backhouse	Backhouse & Dixon, Middlesbro'
Batchelder	J. M. Batchelder, Shanghai
Birely	Birely & Son, Philadelphia
Blackwood	Blackwood & Gordon, Port Glasgow
Blair	Blair & Co., Ltd., Stockton-on-Tees
Boole	G. & T. Boole, East Boston
Boulton	Boulton & Watt, Birmingham
Boyd	Boyd & Co., Shanghai
Brown	William H. Brown, New York
Caird	Caird & Co., Greenock
Clark	George Clark, Southwick (Sunderland)
Collyer	Thomas Collyer, New York
Collyer & L.	Chas. S. Collyer & A. G. Lambert, Yankin & Pootung
Coryell	Miers Coryell (Marine Supt. for S. S. N. Co.), Pootung
Cowper	J. C. Cowper, Whampoa
Cramp	William Cramp & Sons, Philadelphia
Crawford	John Crawford, Keyport, N. J.
Delamater	Delamater Iron Works, New York
Denny	Wm. Denny & Bros., Dumbarton
Denny & Co.	Denny & Co., Dumbarton
Denton	Denton, Gray & Co., West Hartlepool
Deptford	Deptford Dock Yard
Dickson	Dickson & Co., Scranton, Pa.
Dillon	John Dillon, Newburgh, New York
Dobie	Dobie & Co., Govan
Dunham	H. R. Dunham & Co., New York
Edwards	Edwards,[737] Niagara-on-the-Lake, Ontario
Elder	J. Elder & Co., Govan
Englis	John Englis & Son, New York
Essler	Henry Essler & Co., Brooklyn, New York
Etna	Etna Iron Works (John Roach & Son), New York
Farnham	S. C. Farnham & Co., Shanghai
Faron	T. H. & E. Faron, New York
Fletcher	Fletcher, Harrison & Co., Hoboken, New Jersey
Forrester	Geo. Forrester & Co., Vauxhall Foundry, Liverpool
Fossick	Fossick & Hackworth, Stockton-on-Tees
Gray	R. & J. B. Gray
Greenman	Geo. Greenman & Co., Mystic Bridge, Conn.
Greenock	Greenock Foundry Co., Greenock
Hall	Samuel Hall, East Boston
Hammond	William Hammond, Port Ludlow, Wash.
Harlan	Harlan & Hollingsworth, Wilmington, Delaware
Harman	H. W. Harman, Northfleet, Kent
Harrington	T. Harrington, London
Hawthorn	R. & W. Hawthorn, Newcastle-upon-Tyne
Hedderwick	Hedderwick & Co., Govan
Henderson	Henderson, Coulborn & Co., Renfrew

[737] Possibly Captain David F. Edwards, who had worked in W. H. Webb's shipyard and was subsequently engaged in shipbuilding on the Great Lakes. See *The Great Lakes* (J. H. Beers & Co., Chicago and Logansport, 1899), II, 301. Edwards was the name of the master-builder, the steamer being probably built on the premises of the Niagara Harbour and Dock Co.

Hogg	Hogg & Delamater, New York
Hornby	W. B. Hornby, Newcastle-upon-Tyne
Howden	J. Howden & Co., Glasgow
Howrah	Howrah Dock Co., near Calcutta
Humphreys	Humphreys & Pearson, Hull
Inglis	A. & J. Inglis, Pointhouse, Glasgow
Irvine	R. Irvine & Co., Hartlepool
Jackson	Jackson & Blake, Northfleet
Jewett	James C. Jewett, Brooklyn, N. Y.
Joy	D. Joy & Co., Middlesbro'
Kyd	Kyd & Co., Kidderpore (near Calcutta)
Laing	James Laing, Deptford (Sunderland)
Laird	Laird Bros., Birkenhead
Lawrence	Lawrence & Foulkes, Williamsburg (Brooklyn), N. Y.
Lawrie	J. G. Lawrie, Whiteinch
Lees	Lees, Anderson & Co., Glasgow
Liquori	Sebastiano Liquori, Eden Landing, California
London & G.	London & Glasgow Shipbuilding & Engineering Co., Ltd., Govan
Loring	Harrison Loring, South Boston
McDougal	Hugh McDougal & Co., Hong Kong
McLeod	D. McLeod
Mallory	Charles Mallory, Mystic, Connecticut
Mare	C. J. Mare, Millwall, Middlesex
Marshall	R. J. Marshall, South Shields
Maudslay	Maudslay, Son & Field, Lambeth (London)
Maxton	J. B. Maxton, Leith
Miller	W. C. Miller & Co., Liverpool
Mitchell	C. Mitchell & Co., Low Walker (Newcastle-upon-Tyne)
Morgan	Morgan Iron Works, New York
Napier	Robert Napier & Sons, Govan
Neafie	Neafie & Levy, Philadelphia
Neptune	Neptune Iron Works (Boardman, Holbrook & Co.), New York
Novelty	Novelty Iron Works (Stillman, Allen & Co.), New York
Osbourne	Osbourne, Graham & Co., North Hylton (Sunderland)
Oswald	T. R. Oswald & Co., Pallion (Sunderland)
Owens	Henry Owens, San Francisco
Pearse	M. Pearse & Co., Stockton
Pease	Pease & Murphy (Fulton Iron Works), New York
Penn	John Penn & Sons, Greenwich
Perine	Perine, Patterson & Stack, Williamsburg, N. Y.
Pitcher	William Pitcher, Northfleet, Kent
Poillon	C. & R. Poillon, Brooklyn, N. Y.
Pusey	Pusey & Jones, Wilmington, Delaware
Rait	Rait & Lindsay, Glasgow
Rankin	Rankin & Blackmore, Greenock
Ravenhill	Miller, Ravenhill & Salkeld, Low Walker (Newcastle-upon-Tyne)
Reanie	Reanie, Neafie & Co., Philadelphia
Reiherstieg	Reiherstieg Schiffswerfte & Maschinenfabrik, Hamburg
Richardson	T. Richardson & Sons, Hartlepool
Rideout	J. R. Rideout, San Francisco
Robb	John A. Robb, Baltimore
Roberts	John P. Roberts, Shanghai
Robinson	George Robinson & Co., Cork
Rodman	Rodman & Co.
Rollo	D. Rollo & Sons, Liverpool
Roosevelt	Roosevelt & Joyce, New York
Ross	Ross, Hong Kong
Rowland	T. F. Rowland (Continental Iron Works), Greenpoint, L. I.

S. S. N.	Shanghai S. N. Co., Shanghai
Sampson	A. & G. T. Sampson, East Boston
Samuelson	M. Samuelson, Hull
Samuda	Samuda Bros., Poplar (London)
Secor	T. F. Secor, New York
Simonson	Jeremiah Simonson, Greenpoint, L. I.
Sneden	Samuel Sneden, Greenpoint, L. I.
Sneden & L.	Sneden & Lawrence, Greenpoint, L. I.
Steele	R. Steele & Co., Greenock
Steers	Henry Steers, Greenpoint, L. I.
Stephen	Alexander Stephen & Sons, Linthouse, Glasgow
Sutton	Jas. T. Sutton & Co., Philadelphia
Tennant	Tennant & Co., Leith
Thomson, J. & G.	J. & G. Thomson, Clydebank
Thomson, J. & J.	J. & J. Thomson, Finnieston (Glasgow)
Tobey	Tobey & Littlefield, Portsmouth, N. H.
Tod	Tod & MacGregor, Meadowside (Glasgow)
Tufts	Otis Tufts (Boston Steam Engine Co.), Boston
Tulloch	Tulloch & Denny, Dumbarton
van Deusen	J. B. & J. D. van Deusen, New York
Vernon	Thomas Vernon & Co., Liverpool
Watt	James Watt & Co., Birmingham
Webb	William H. Webb, New York
West Point	West Point Foundry, New York
West Street	West Street Foundry, New York
Westervelt	Jacob Westervelt & Son, New York
Whitlock	Elisha P. Whitlock, Greenpoint, L. I.
Williams	E. F. Williams, Greenpoint, L. I.

Abbreviations of terms in Appendix III

C. B.	Cross-beam	Pad.	Paddle (side-wheel)
Cpd.	Compound	S. L.	Side-lever
D. A.	Inverted direct-acting	S. T. G.	Single-trunk geared
Diag.	Diagonal	Scr.	Screw (propeller)
G. B.	Geared beam	St.	Steeple
Hor.	Horizontal	T. E.	Triple expansion
Incl.	Inclined	T. G.	Trunk geared
Osc.	Oscillating	Tr.	Trunk
P. D.	Plunger direct	V. B.	Vertical beam

Official Numbers of Steamers Mentioned

Only one official number is given for each ship, the nationalities preferred being (1) American, (2) British, (3) other, in that order. In consequence, the official number may not correspond to the name given in this table. Changes of name can, however, be ascertained from the text. Many of the steamers treated had, of course, no official number at any time. Official numbers are British, unless otherwise indicated.

Abbotsford	62287	*Blythwoode*	63620
Acantha	63653	*Cadiz*	31155
Aegean	62288	*Capron*	(Jap.) 278
Albay	63841	*Chieftain*	64145
Alexander	(U. S.) 1739	*Chihli* (1867)	56784
Altona	68359	*Chihli* (1871)	63879
Ariel	(U. S.) 797	*Chusan* (1852)	30713
Arizona	(U. S.) 800	*Chusan* (1866)	(U. S.) 26521
Bellona	(Jap.) 1002	*Chusan* (1874)	71670
Bengal	30709	*City of Exeter*	60301

Consolation 65784
Costa Rica (U. S.) 4882
Craigforth 62278
Duna 62300
Erl King 52820
Express 43695
Fah Kee (U. S.) 9442
Fairy 63295
Feima 32745
Fenella 31973
Fire Queen 50504
Fokelin 48512
Forbes 40983
Fuhle 63559
Fung Shuey (U. S.) 24377
Fusiyama (1862) 45069
Fychow (U. S.) 18299
Ganges 31249
Glendarroch 63805
Glengyle 59009
Golden Age (U. S.) 10519
Hangchow (U. S.) 26653
Hellespont 31592
Hong Kong 32713
Howquah (U. S.) 8551
Hupeh 63755
Kaga-no-kami (U. S.) 14116
Kiang Soo (U. S.) 6708
Kiukiang 50662
Kiushiu 44999
Kuroda (Jap.) 459
Kwangchow 63868
Laptek 68396
Lotus 44850
Luzon 48929
Mars 44863
Mecca 62664
Meteor (1850) 32597
Milbanke 62487
Millet 60428
Mona 47591
Mongol 68496
Mowtan (Jap.) 506
New York (U. S.) 18301
Oregonian (U. S.) 19219
Oriflamme (U. S.) 19201
Paokong 72743
Paou Shun (U. S.) 18305
Paouting 68076
Pawtuxet (U. S.) 20167
Peiho 72738
Perusia 20178
Pingon (U. S.) 16385
Plymouth Rock 50503
Poyang 50661
Rajah 25225
Rocket 62988
Rona 44831
Scotland 17494
Shaftesbury 45002
Shantung (1870) 63549
Shingking 68040
Soochow (1858) 48331
Soochow (1865) 52747
Spark 64093
Spec 41236
Sultan 13990
Sunfoo 65572
Ta Yung 27234
Tartar 68466
Thales 52608
Thames (U. S.) 24591
Trafalgar 65630
Tunsin 48646
Unicorn 32708
Union 25117
United Service 16840
Vancouver 68519
Vasco de Gama 68484
Venus 44864
Washington (1844) 43220
White Cloud 50651
William Miller 62274
Yesso 48343
Yung Hai An 68481
(as s.v. *Lancefield*)
Yungching 65936

APPENDIX IV

A. Revision of Net Profits of the Shanghai S. N. Co.

From copies of the complete reports of the directors of the Shanghai S. N. Co. (for which I am indebted to Dr. K.-C. Liu) it appears that transfers to the Insurance and Depreciation Account were entered as debit items and/or credit items in the Profit and Loss Account, the latter sometimes appearing only implicitly in the calculation of net profits after such deductions. The calculations in the tables in Part II of the present paper for the years ending 31 December 1869-1872 and 1874-1876, inclusive, were obtained (following *NCH*) by adding the above debit items to the net profits after depreciation and insurance, whereas a more exact picture of the net profits from steamers and godowns before deductions for depreciation and insurance is obtained by adding the credit items, resulting in the following figures:

For 12 months ending 31 December 1869	Tls. 718,142.49
For 12 months ending 31 December 1870	781,139.60
For 12 months ending 31 December 1871	951,694.90
For 12 months ending 31 December 1872	674,122.31
For 12 months ending 31 December 1874	188,372.21
For 12 months ending 31 December 1875	196,000.65
For 12 months ending 31 December 1876	178,925.48

B. Financial Data of the China Sea, Saigon & Straits S. S. Co.

Date	*Paid-up capital*	*Total assets*
31 December 1870	$90,000.00	$105,713.99
30 June 1871	90,000.00	130,635.04
31 January 1872	90,000.00	105,395.01
31 December 1872	90,000.00	100,280.86

Earnings of steamers

Period	*Gross earnings*	*Expenses*	*Net earnings*
10 mo. ending 31 December 1870	$149,742.90	$139,782.16	$9,960.74
6 mo. ending 30 June 1871	78,040.16	69,471.67	8,568.49
6 mo. ending 31 December 1871	117,852.75	114,838.51	3,014.24
12 mo. ending 31 December 1872			
Profit on charter of *Suafoo*		$28,029.18	
Less loss on working of *Venus*, depreciation of *Venus*, and loss on charter of *Blythwoode*		20,919.03	
			7,110.15

Dividends and bonuses on freights contributed by shareholders

Period	*Dividends*	*Bonuses*
10 months ending 31 December 1870	$9,000.00 (10%)	$1,163.52 (10%)
6 months ending 30 June 1871	5,400.00 (6%)	762.60 (10%)

There were apparently no further dividends or bonuses paid.

C. Financial Data of the Union S. N. Co.

Date	*Book value of steamers*	*Total assets*
31 March 1869	Tls. 157,560.23	Tls. 284,827.03
31 March 1870	302,904.33	417,482.79[758]

[758] The statements as printed in *NCH* do not balance, the liabilities exceeding the assets by Tls. 1.00, but the former item seems more likely to be correct.

30 September 1870	291,450.00	497,779.94
31 March 1871	291,450.00	449,452.53
30 September 1871	291,450.00	513,979.94
30 September 1872	213,620.00[739]	457,728.90
31 March 1873	29,630.32[740]	355,396.04
31 December 1873	100,371.79[741]	309,911.81

Net profits from steamers, hulks and godowns (before allowance for depreciation)

For 12 months ending 31 March 1868	Tls. 93,054.35[742]
For 12 months ending 31 March 1869	65,026.94
For 6 months ending 30 September 1869	38,692.12[743]
For 6 months ending 31 March 1870	14,659.09
For 6 months ending 30 September 1870	25,574.24
For 6 months ending 31 March 1871	35,239.42
For 6 months ending 30 September 1871	52,957.93
For 6 months ending 31 March 1872	77,009.22
For 6 months ending 30 September 1872	20,350.45
For 6 months ending 31 March 1873	9,131.33 (loss)
For 6 months ending 31 December 1873	24,152.59 (loss)

Dividends paid and bonuses returned to shareholders on freights contributed

Date of report	*Capital*	*Dividends*	*Bonuses*
31 March 1869	Tls. 170,000.00	Tls. 31,762.50 (30%)[744]	Tls. 14,748.93 (10%)
31 March 1870	204,000.00	12,240.00 (6%)	6,263.84 (5%)
30 September 1870	204,000.00	12,240.00 (6%)	5,760.00 (5%)
31 March 1871	204,000.00	———	4,032.47 (5%)
30 September 1871	204,000.00	———	7,846.79 (5%)
31 March 1872	204,000.00	12,240.00 (6%)	8,448.94 (5%)
30 September 1872	204,000.00[745]	12,240.00 (6%)	10,760.00 (5%)
31 March 1873	200,000.00[746]	12,240.00 (6%)	10,096.39
31 December 1873	200,000.00[747]	———	1,309.83

[739] The book value of *Rona*, Tls. 75,000, had been reduced by Tls. 61,380 of insurance, in view of the steamer's loss.

[740] This represents the suspense account of *Rona*. *Tunsin* and *Glengyle* had been sold.

[741] This item is composed of the book value (cost) of *Acantha*, Tls. 82,368.75, and the suspense account of *Rona*, which had been reduced by irrecoverable items to Tls. 18,003.04.

[742] This represents the 'balance in favor of the Company after paying all charges, including preliminary expenses.' No further information is available. Cf. *NCH*, 30 May 1868.

[743] Net profit from all sources. Further details are not available. Cf. *NCH*, 29 December 1869.

[744] First annual dividend, 30% on paid up capital of Tls. 105,875.00.

[745] Tls. 5,000 (par value) of stock had been purchased by the Company and was held in the treasury. Tls. 1,000 of this was reissued the following year.

[746] As of 31 March 1873, Tls. 9,100 of stock was held by the Company.

[747] As of 31 December 1873, Tls. 9,400 of stock was held by the Company.

APPENDIX V

CAPTAINS OF AMERICAN STEAMERS IN CHINA, TOGETHER WITH SHIPS TREATED IN THIS PAPER WHICH THEY ARE KNOWN OR BELIEVED TO HAVE COMMANDED[748]

R. H. Abbott:	*Augusta*
Thomas Allen:	*Surprise*
William W. Allen:	*Kumsing*
Jos. D. Anatovn:	*Ohen Maru*
George W. Andrews:[749]	*Chusan* (ex-*Walrus*), *Fire Queen*, *Hangchow*, *Kiangkoong*, *Kiangse*, *Nanking*, *Tahwah*
P. Armstrong:	*Fire Dart*, *Shantung* (1861)
A. Bain:	*Promise*
George Balchen:	*Union Star*
H. A. Ballard:	*Monitor*, *Scotland*
H. A. Barclay:	*Moneka* (later-*Pingon*)
R. Barcham:	*Governor General*, *Peiho* (1859)
*Thomas Bassett:	*Honan*, *Millet*
N. W. Beckwith:	*Peiho* (1859)
J. C. Bennett:	*John T. Wright*, *Santa Cruz*
P. Bennett:	*Mars*
A. A. Benning:	*Little Orphan*
*Gordon G. Berry:	*Kiangse*
C. Birch:	*Hyson* (1872), *Tsatlee*
A. Blanchard:	*Anna*
W. Blethen:	*Chusan* (1852), *Shaftesbury*
Brech:	*Min*
George Briggs:	*Moyune*, *Poyang*
Henry Brown:	*Kaga-no-kami*
J. F. Brown:	*Soochow* (1865)
Charles G. Bunker:	*Vulcan*
H. W. Burdett:	*Ariel*, *Golden Age*
T. F. Burr:	*Novelty*, *Tungting*
Daniel Cavanagh:	*Bunker Hill*, *D. Cavanagh*
Arthur Hamilton Clark:	*Manchu* (ex-*A. J. Ingersoll*), *Suwonada*, *Venus*
Jabez W. Clark:	*Titana*
W. B. Cobb:	*Golden Age*
Conner:	*Costa Rica*
Corning:	*Relief*
Coy:	*Golden Age*, *Nevada*
J. T. (J. F.) Crowell:	*Venus*
John A. Cunningham:	*Pembroke*
T. (?) Cunningham:	*Fenella*
William Curry:	*Enterprise*, *Willamette*
Samuel R. Curwin (Curwen)	*Shanse*
Christopher C. Dall:	*Cortes*, *St. Louis*

[748] Since only the last name of the captain usually appears in newspaper shipping intelligence and since this is frequently the case in consular returns also, it has not been possible to make this list complete either as to captains or as to the ships they commanded. Variations appearing in the names of the captains are given in parentheses. The ships are listed under each individual in alphabetical order. The captains were supposed to be American as far as possible, but a few are known to have been British and are so indicated. An asterisk indicates that the master in question held a certificate (sometimes expired) from the American Shipmasters' Association.

[749] 'Captain G. W. Andrews, until lately in charge of the *Kiangyung*, died at London a short time ago' (from *NCH*, 1st June 1883).

*Henry C. Dearborn:	*Nevada, Oregonian*
Thomas W. Dearborn:	*Confucius, Yangtsze*
J. Derrick:	*Paokong*
W. U. Deville:	*Kiushiu, Pingon*
A. R. Dolle:	*Cricket, Mandarin*
C. B. Ellis:	*Kiushiu, Shaftesbury*
James Bridges Endicott:	*Spark*
Benjamin C. Fessenden:	*Moneka*
F. J. Filleul:	*Hellespont, Tayung*
Alphonso F. Friend:	*Fychow, Hirado, Honan, Kiangloong, Moyune, Shantung, Szechuen* (1876)
David S. Fuller:	*General Ward*
W. G. Furber:	*Costa Rica, New York*
C. L. Gardiner:	*Scotland*
Thomas F. Gilman:	*St. Louis*
R. M. Gilmore (Gilmor):	*Honan*
R. Glashoff:	*Maria*
N. Goodwin:	*Pawtuxet*
Horatio N. Gray:	*Fire Queen, Hirado, Plymouth Rock*
*Henry J. Green:	*Mars*
H. A. Hallett:	*Woosung*
Hammond:	*Plymouth Rock*
James Hardie (Hardy) (Br.):	*Fusiyama* (1863), *Hirado*
Joseph Harmon:	*Fusiyama* (1863), *Hupeh, Moyune*
Thomas A. Harris:	*Peiho* (1859)
C. A. Hawes:	*Shantung* (1870)
W. H. Heath:	*Honan*
*Jerome B. Hildreth:	*Fung Shuey*
L. B. Hodges:	*Nautilus* (later-*Fychow*)
A. Holmes:	*Meteor* (A. Heard & Co.)
R. W. Hutchison:	*St. Louis*
*Clement P. Jayne:	*Hupeh, Shanse, Suwonada*
B. R. Johnson:	*China*
George C. Johnson:	*Chusan* (1874), *Hupeh, Moyune*
Henry W. Johnson:	*Fire Cracker, Fire Dart, Fire Queen*
William O. (C.) Johnson:	*Fohkien*
Edmund Kemble:	*Meteor* (1864), *Rover*
Samuel Kennedy:	*Szechuen* (1862)
G. W. Kenney:	*Millet*
G. W. Lake:	*Flying Cloud*
*George E. Lane:[750]	*New York, Oriflamme*
George W. Lewis:	*Edith*
Charles V. Lloyd:	*Fychow, Warrior* (later-*Hangchow*)
C. J. Lovett:	*Martin White, Tahwah, Taoutai*
A. C. Lowell:	*Cadiz, Pingon, Tsatlee, Viborg*
D. H. Lynch:	*Martin White*
A. A. McCaslin:	*Fung Shuey, Mars*
C. H. McCaslin:	*Feepang, Honque, Monitor, Orphan*
R. J. McCaslin:	*Augusta*
McQueen (Br.):	*Cosmopolite, Governor General, Hirado*
Edward Mellus:	*Antelope*
J. Mooney:	*Express, Hellespont*
Henry Morrison:	*Yung Hai An*
A. H. Morse:	*Kiangloong, Kiangse, Manchu, Nanking, Walrus* (later-*Chusan*)

[750] Captain George E. Lane was for many years agent of the Pacific Mail S. S. Co. at Yokohama.

E. M. Neal:	*Columbia*
W. E. Newcomb:	*Willamette*
Newell:	*Ariel*
Samuel Newton:	*White Cloud*
Benjamin Osborn:	*Contest, Surprise*
M. F. (M. T.) Patterson:	*Chihli* (1867), *Warrior* (later-*Hangchow*)
*Josiah W. Paul:	*Fire Queen, Fychow, Nanking, River Bird, White Cloud*
F. Pearson:	*Louisa*
William H. Peele:	*Kiangloong, Shantung* (1861)
J. O. Pendleton:	*Surprise*
J. A. Perkins:	*Pembroke, Willamette*
William Poor:	*Midas*
*John R. (E.) Potter:	*Kewanee*
A. P. Preble:	*Emperor, Yokohama Maru*
Isaac Preble:	*Pluto*
Charles Reed:	*John S. Williams*
Ricaby:	*Meelee, Spark*
James P. (John P.) Roberts:	*Huquang, Nautilus* (later-*Fychow*)
W. M. (W. R.) Robinet:	*St. Louis*
*Joseph Rowse:	*Ashuelot*
E. T. Sandford:	*Rose* (A. Heard & Co.)
John L. Sandford (Sanford):	*Takiang*
George U. Sands:	*Hankow, White Cloud*
J. C. Saunders:	*Rose* (J. B. Endicott)
William B. Seabury:	*Arizona*
C. E. Simmons:	*Honan, Nautilus* (later-*Fychow*), *Plymouth Rock*
J. A. Smith:	*Novelty*
W. Smith:	*Tah-yue-fong*
D. R. Spedding:	*Tungting*
Spencer:	*Szechuen* (1862)
F. A. Strandberg:	*Yangtsze* (1868)
John Sweeney:	*Touitia*
S. N. Taylor:	*Kiukiang*
E. Thebaud:	*Fung Shuey*
*Edwin D. Wadsworth:	*Chekiang*
Henry G. Walcott (Wolcott):	*Hankow*
J. S. Watson:	*Fung Shuey, Meteor* (1864)
C. H. Wells:	*Millet, Paouting, Shantung*
W. A. West:	*Fusiyama* (1863), *Fychow, Hangchow, Hirado, Kiangloong, Plymouth Rock*
Comfort Whiting:	*Varuna, Yung Hai An*
Frank Williams:	*Costa Rica, Nevada*
*Alexander Winsor, Jr.:	*Orloff* (later-*Tokei Maru*)
Wise:	*Golden Age*
M. L. Woodward:	*Meteor* (A. Heard & Co.)
S. C. Wood:	*Pet*
Samuel Yeaton:	*Kankakee*
L. F. Zimmerman:	*Ariel*

ADDENDA AND CORRIGENDA

(References are to the AMERICAN NEPTUNE)

XVI, 159 Footnote 5. See also footnote 701.

XVI, 164 The *Confucius* of 1853 was in fact the steamer of that name wrecked on the Yangtsze in 1870. Cf. *Shanghai News Letter*, 11 February 1870.

XVI, 168 *Willamet'e* was operated in California under the name of *Thomas Hunt*, but resumed her original name when she went to China. See *Democratic State Journal* (Sacramento), 17 December 1852; Sacramento *Union*, 7 May 1855; and San Francisco *Evening News* of about the latter date. I am indebted to Colonel Fred B. Rogers of San Francisco for these references.

XVI, 243 While owned by the Prince of Chosiu, *Lancefield* (then named *Koshin Maru*), had been disabled and probably sunk in shallow water in the Straits of Shimonoseki by U.S.S. *Wyoming*, 16 July 1863. See F. O. Adams, op. cit., pp. 295-296; S. Mossman, *New Japan* (London, 1873), p. 175.

XVI, 649 Line 7, 'Carver' should probably be 'Curwin.'

XVI, 259 In a letter to W. H. Forbes dated 16 October 1873, F. B. Forbes says, 'You will be sorry to hear that the *Chusan* is done up. The state of her timber and planking is dreadful—the more so, as it was unsuspected. Only seven months ago she was bored and found to be quite sound!' (I am indebted to Dr. K.-C. Liu for this quotation.)

XVI, 259 Messrs. A. & J. Inglis have kindly pointed out that *Millet* was set up at Glasgow, not at Shanghai. On her way out, she left Glasgow on 12 June 1869, carrying 275 tons of coal. See also *HMD* 31, II, 231. The statement of W. S. Fitz, ibid., I, 884, is evidently not correct.

XVI, 262 *Hacau*, originally *Shingking*, was scuttled as a blockship in the Whangpoo River, October 1937, and cut up for scrap later (from information furnished by the Central Record of the World Ship Society).

XVI, 262 *Paouting* was laid down as *Mikado*.

XVI, 268 For revision of the net profits of the S. S. N. Co., see Appendix IV-A.

XVI, 269 The figure for the total assets of the S. S. N. Co. as of 31 December 1867 should be Tls. 1,961,762.23.

XVII, 61 There is some evidence to indicate that *Little Orphan* was later renamed *Orphan*, owned as of May 1867 by T. F. Benning (see *CRS*, Nagasaki), and that this was the *Orphan* burned, 11 January 1872, on her way from Hiogo to Nagasaki with the loss of two lives (see *NCH*, 1 February 1872). Her owners at the time were Boyd & Co., who replaced her by a new tug of the same name built later in the year.

XVII, 62 *Ashuelot* and *Kankakee* were probably screw steamers, not side-wheel.

XVII, 138 Footnote 427. *Fushimi Maru*, originally *Thales*, was broken up in Japan in 1911 (from information kindly furnished by the Central Record of the World Ship Society).

XVII, 149 Plate 14. For '*Kin Kiang*,' read '*Kiukiang*.'

XVII, 309 *Rocket* was sold for scrap in 1938 and *Fuhle* broken up at Shanghai in 1941 (from information furnished by the Central Record of the World Ship Society).

XVII, 312 For '15 February' in footnote 666 read '14 February.'

Edward Kenneth Haviland received the degrees of A.B. (from Haverford College in 1923), A.M. and Ph.D. (in Chemistry) (from Harvard University in 1925 and 1930, respectively), and Ph.D. (in Mathematics) (from The Johns Hopkins University in 1934). He is at present Associate Professor of Mathematics at The Johns Hopkins University and has published a number of research papers in pure Mathematics. Both he and Mrs. Haviland have long been maritime collectors.

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Abbreviations: *ADW, Annual Dog Watch* (Australian), 1957; *D&HA, Dock & Harbour Authority; MCF, Maine Coast Fisherman; SBF, Steamboat Bill of Facts; S&S, Ships and the Sea; USNIP, United States Naval Institute Proceedings.*

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We Get the Tough Assignments, 11 pp. *Tow Line* (Moran), Aug. Towing of Texas-type radar platform no. 4 from South Portland, Maine, to its offshore location, 70 miles from nearest land; includes 34 photographs. Also in *Construction Methods*, Aug., 5 pp.; and *Engineering News*, 18 July, 2 pp.

VIb. *Merchant Steam—Other Regions*

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BERNSTEIN, H. T., *Steamboats on the Ganges, 1828-1850*, unpub. Ph.D. thesis, Yale, 1955-56.

CORY, R., see Sect. IV.

COURSE, A. G., Tramps, 4 pp. *PLA* (Port of London Authority), Sept.

DAVID, J. M., Early Channel Islands Steamers, 1823-40. *La Societe Guernesiaise Rep. Trans.*, Vol. 15, 1954.

DORSETT, E. L., USNR, The Tragedy of the 'Fantee.' *ADW*. Captain and two others killed by gas fumes after Elder-Dempster liner ran aground on Cape Palmas in West Africa, 14 Sept. 1909.

FINCH, F. B., The 'Mooloo' Episode. *ADW*. Wreck of sugar-laden steamer on Australian coast, 5 March 1955.

Fortunes of France, Fenwick and Co., Ltd., 43 pp. *Sea Breezes*, Aug.-Sept. Line organized in 1901, principally engaged in operating colliers on east coast of England. Additional remarks by A. D. Pelly, 2 pp. Ibid., Oct.

HARDY, A. C., Norway's Coastal Trade, 5 pp. *Shipbuilding*, 28 Feb.

HAUSER, E. O., The Mysterious Mr. Niarchos, 4 pp. *Saturday Eve. Post*, 21 Sept. 'Boss of the world's biggest fleet of privately owned oil tankers.'

HOBBS, J. L., An Eventful Tow, 3 pp. *Sea Breezes*, Aug. Union Towing Co.'s 'Englishman' brought naval tanker 'Olcades' from Singapore to Blyth in 1952, with tow twice breaking loose and other misadventures.

ISHERWOOD, J. E., The 'Kaiser Friedrich': A Sad Career, 4 pp. *Sea Breezes*, Aug. North German Lloyd returns to Danzig builders liner completed in 1898 for failure to maintain contract speed; later purchased by French South Atlantic line; torpedoed and sunk in 1916.

——— Guion Line's 'Arizona,' 4 pp. Ibid., Sept. Built in 1879; for a while fastest ship on Atlantic; later a U. S. transport.

——— The Unfortunate 'Royal George,' 4 pp. Ibid., Oct. Built 1907 for Mediterranean service; later served on North Atlantic for Canadian Northern and then Cunard, without distinction.

KOENIG, DUANE, I Ran the Nationalist Blockade of Red China, 2 pp. *S&S*, Winter. In British freighter 'Manchester Castle,' 1949.

KUHNLE, H., JR., Post-war Trends in Norwegian Shipping, 4 pp. *Norwegian Commercial Banks Fin. Rep.*, April.

LIU, KWANG-CHING, *Two Steamship Companies in China, 1862-1877*, unpub. Ph.D. thesis, Harvard, 1955-56.

SCOTT, M. A., Bound for the Far East, 8 pp. *S&S*, Winter. Trip from New York through Panama Canal on Prince Line freighter.

VEALE, E. W. P., *Gateway to the Continent: a History of Cross-Channel Travel*, London, Allen, 1955.

VII. *Inland Navigation*

BATES, A. L., What's in a Riverboat Pilothouse? 1 p. *S&S*, Winter.

BOGLE, V. M., New Albany: Mid-Nineteenth Century Economic Expansion, 20 pp. *Indiana Mag. of Hist.* Ohio River town, opposite Louisville.

BEYER, B. K., The Chenango Canal and the Campaign for its Construction, 19 pp. *N. Y. History*, July.

DOWLING, E. J., The Story of the Whaleback Vessels and of their Inventor, Alexander McDougall, 11 pp. *Inland Seas*, Fall.

FLEMING, R. F., The Burning of the 'Ocean Wave,' 3 pp. *Inland Seas*, Fall. New steamer, lost on Lake Ontario 30 April 1858 with loss of 33 lives.

GREEN, C. M., see Sect. VIIIa.

HELM, THOMAS, Old Man River Keeps on Rolling, 5 pp. *S&S*, Winter. Mississippi River towboats.

HEYES, F. C., Fifty Years of Chicago-Mackinac Races, 5 pp. *Yachting*, July. To be continued.

HICKMAN, N. W., Logging and Rafting Timber in South Mississippi, 1840-1910, 19 pp. *Jour. Miss. Hist.*, July.

HILL, F. G., *Roads, Rails and Waterways: the Army Engineers and Early Transit*, 259 pp. $4.00. Norman, Univ. of Oklahoma. See also Maass, XII, 167.

HUBER, L. V., Heydey of the Floating Palace, 14 pp. *American Heritage*, Oct. Mississippi River steamboats, with 17 illustrations, 10 in color.

MERDINGER, C. J., USN, Canals Through the Ages, 11 pp. *Military Engineer*, July-Aug., Sept.-Oct. To be continued.

NEVILL, J. T., The 'Russia,' 4 pp. *Inland Seas*, Fall. Screw steamer, built at Buffalo in 1872, capsized and sank, 30 April 1909 in Lake Huron.

PRESTON, R. A., The First Lighthouse on Lake Ontario near Kingston, 7 pp. *Inland Seas*, Fall.

RATIGAN, W., *Straits of Mackinac: Crossroads of the Great Lakes*, 136 pp. $3.00. Grand Rapids, Eerdmans.

REEVES, H. F., The Bob-Lo Boats—A Living Tradition, 3 pp. *Inland Seas*, Fall. Excursion boats from Detroit to Bois Blanc at head of Lake Erie, since 1898.

WELLMAN, M. W., *Fastest on the River: The Great Race Between the 'Natchez' and the 'Robert E. Lee,'* 234 pp. $3.95. New York, Holt.

VIIIa. *Seaports and Coastal Areas—North America*

ALIG, W. B., Forgotten Island: Tangier in the Chesapeake, 6 pp. *Americas*, Dec. 1956.

BECK, H. P., *The Folklore of Maine*, 284 pp. $5.00. Philadelphia, Lippincott.

BAIRNE, F. F., *Baltimore . . . a Picture History, 1858-1958*, 159 pp. $5.00. New York, Hastings House. Compiled under auspices of the Maryland Historical Society.

BROOK, PETER, Isles of a Thousand Wrecks, 3 pp. *The Bermudian*, Sept. Shipwrecks at Bermuda from French man-of-war in 1591 to 'Reina del Pacifico' in 1957.

BURGESS, R. H., They Penned a Bay Sailing Classic. *Baltimore Sunday Sun Mag.*, 17 Feb. Description of Chesapeake yachting, 1909.

——— Steer for the White Rocks. Ibid., 17 March. Background of only major outcropping of rocks in Chesapeake region and their use in aiding navigators into Patapsco River.

——— The Lone Mailman of Currituck Sound. *Norfolk Virginian-Pilot*, 11 Aug. Account of waterborne mailman between mainland and Currituck Bank, N. C.

CALALDO, LOUIS, et al., *Pictorial Tales of Cape Cod*, 52 pp., paper. $1.00. Hyannia, Tales of Cape Cod, Inc. The 65 photographs include numerous shipmasters and shipwrecks.

COLBECK, W. R., RNR, et al., Port Operation in Fog. 18 pp. *Jour. Inst. of Navigation*. Particular emphasis on radar at Liverpool.

FISHER, O., The Soviet North and the Canadian North, 7 pp. *Can. Geog. Jour.*, Sept.

FLEMING, H. A., *Canada's Arctic Outlet: a History of the Hudson Bay Railway*, 129 pp. $3.50; paper, $2.50. Berkeley, U. of C. Press. See also Leitch below.

FOSCUE, E. J., The Ports of Texas and their Hinterlands, 14 pp. *Tijdscrift voor Econ. en Sociale Geog.*, Dec. 1956. See also Gregory, Hyenaes below.

GILLIAM, HAROLD, *San Francisco Bay*, 335 pp. $4.50. New York, Doubleday. Primarily descriptive rather than historical. See also Huff and Kemble below.

GREEN, C. M., *American Cities in the Growth of the Nation*, 258 pp. $6.50. New York, De Graff. Ch. I, The Seaboard Cities at the Opening of the Nineteenth Century: New York, Philadelphia, Baltimore, Charleston, Boston. Ch. II, The River Cities: Cincinnati, St. Louis, New Orleans.

GREENING, W. E., Some Recent Changes in the Economy of Newfoundland, 22 pp. *Can. Geog. Jour.* Variegated activity in place of former dependence on fishing.

GREGORY, LLOYD, et al., (Texas Ports), 9 pp. *Marine News*, Oct. Brief articles on Houston, Corpus Christi, Beaumont, Lake Charles.

HILL, F. G., see Sect. VII.

HUFF, B. F., *The Maritime History of San Francisco Bay*, unpub. Ph.D. thesis, Univ. of California, Berkeley, 1955-56.

HURLEY, D. F., et al., Port of Boston. *Marine News*, July. Articles on various aspects, including shipbuilding, Mass. Port Authority, defense installations, etc.

HYENAES, T., The Port of Houston. *Norwegian Shipping*, 25 May. History from 1830's.

KEMBLE, J. H., *San Francisco Bay*, 195 pp. $10.00. Cambridge, Md., Cornell Maritime Press. A scholarly pictorial record of the various periods and aspects of the Bay's history, along the general lines of the same publisher's volumes on Chesapeake Bay by M. V. Brewington and the Delaware by D. B. Tyler.

LEE, E. L., JR., *The History of Lower Cape Fear: the Colonial Period*, unpub. Ph.D. thesis, Univ. of N. C., 1955-56.

LEITCH, ADELAIDE, Sea Traffic for a Trading Post, 2 pp. *S&S*, Winter. Moosonee on James Bay, off Hudson's Bay, new railhead on Ontario Northern Railway; includes historical sketch of nearby Moose Factory, established 1673.

LOWREY, W. M., *Navigational Problems at the Mouth of the Mississippi River, 1698-1880*, unpub. Ph.D. thesis, Vanderbilt, 1955-56 (Dissertation Abstracts, Vol. 16, 1436).

MACKAYE, MILTON, Death on the Waterfront, 7 pp. *Saturday Eve. Post*, 26 Oct. 'Minute-by-minute account of the terrible blast that destroyed Texas City' near Galveston on 16 April 1947, after cargo of ammonium nitrate exploded on S. S. 'Grandcamp,' killing 570 and injuring 3,000.

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PARTRIDGE, W. A., Fire Fighting in Oil Ports, 2 pp. *D&HA*, Aug. By the former Chief Fire Officer, Abadan. See also Rushbrook, below, and *Marine News*, 3 pp., Oct.

ROBERTS, P. W., USN, & BLANCATO, V., Protection of Waterfront Structures, 4 pp. *Military Engineer*, July-Aug.

RUSHBROOK, FRANK, Fire Fighting in Ports: International Standardization Required, 5 pp. *D&HA*, July. By Chief Fire Officer, East Ham.

RYAN, J. J., 'Tanker Alley,' Vital Channel, Bursting Seams. *N. Y. Times*, 3 Nov., v., 12. 'Serpentine, thirty-mile stretch of waterway that separates Staten Island from the New Jersey shore,' site of most of port's oil storage and refining, becoming inadequate to accommodate huge new tankers.

SIDDALL, W. R., Seattle: Regional Capital of Alaska, 8 pp. *Annals Assn. American Geog.*, Sept.

ZAHL, P. A., The Giant Tides of Fundy, 30 pp. *Nat. Geog.*, Aug.

VIIIb. *Seaports and Coastal Areas—Other Regions*

BIRD, JAMES, *The Geography of the Port of London* (Hutchinson's Universal Library), 207 pp. 10*s* 6*d*. London, Hutchinson; $1.50, New York, Rinehart. See also Grosvenor below.

BOWIE, B. M., Off the Beaten Track of Empire, 43 pp. *Nat Geog.*, Nov. Prince Philip's visits to numerous remote and lonely islands.

DANIEL, HARRY, The Bay of Dead Ships, 5 pp. *ADW*. Laid-up vessels of many types in bay near Montevideo.

EGLEN, W. E., In the Bay: Experiences of a Port Philip Pilot, 4 pp. *ADW*. Approaches to Melbourne.

FRANKLIN, E. C., *A Century of Auckland Commerce, 1856-1956: A History of the Auckland Chamber of Commerce*, 201 pp. 15*s*. Auckland, N. Z., The Chamber, 1956.

GROSVENOR, JOAN, *Port of London*, 110 pp. 9*s* 6*d*. London, Staples; $2.25. Toronto, Burns & MacEachen. See also Bird above.

HANCE, W. A., & VAN DONGEN, I. S., Lourenco Marques in Delagoa Bay, 19 pp. *Econ. Geog.*, July.

——— The Port of Lobito, and the Benguela Railway, 18 pp. *Geog. Rev.*, Oct. 1956.

——— The Economic Geography of Madagascar, 12 pp. *Tijdscrift voor Econ. en Sociale Geog.*, July-Aug. Extensive bibliography (Hance only).

——— Nacala: Newest Mozambique Gateway to Interior Africa, 8 pp. Ibid., March (van Dongen only).

——— Angola, 6 pp. *Focus*, Oct. (van Dongen only).

From a series of studies on various aspects of sea and land transportation affecting Central Africa, prepared under a Columbia University contract with the Office of Naval Research. See also van Dongen below.

HESELTINE, C., Table Bay in 1900, 3 pp. *Sea Breezes*, Oct. Apprentice's experience on sailing ship at Capetown during Boer War.

LODEWICK, JOHN, *The Forbidden Coast; the Story of a Journey to Rio de Oro, a Spanish Possession in North-West Africa. . . .* 216 pp. 21s. London, Cassell, 1956.

LOSHI, C. B., The Historical Geography of the Islands of Bombay, 9 pp. *Bombay Geog. Mag.*, Dec. 1956. See also Osborn and Sarma below.

MATTHEWS, K. D. JR., *Cities in the Sand: Leptis Magna and Sabratha in Roman Africa*, 160 pp. $10.00. Univ. of Pa. Press. Two early centers of trade and commerce on coast of Libya.

MELAMID, ALEXANDER, The Political Geography of the Gulf of Aqaba, 10 pp. *Annals Assn. Am. Geog.*, Sept.

MITCHELL, W. H., *Ships and East Africa*, 32 pp., paper. Dar-es-Salaam, 1954. Details on steamship lines serving East African ports.

OSBORN, E. C., Royal and Dower-Royal Bombay, 3 pp. *Trident*, Sept. See also Loshi above and Sarma below.

Port Capacity and Shipping Turnaround in West Africa, 46 pp. *Economic and Statistical Review* (United Africa Co.), March.

The Port of Oamaru, New Zealand: Development of a Dominion Harbour, 3 pp. *D&HA*, Aug.

The Ports of South Wales, 20 pp. *D&HA*, May-Sept. 'History and development' of Cardiff, May; Swansea, July; Newport, Aug.; Barry, Sept.

Postwar Port Developments in the United Kingdom, 24 pp. *D&HA*, July. Includes accounts of 13 different ports or port areas.

REYNAULT-ROULIER, RAYMOND (Remy, pseud.), tr. from the French by L. C. Sheppard, *Goa, Rome of the Orient*, 238 pp. $5.00. Westport, Ct., Assoc. Booksellers.

SARMA, K. G., Port of Bombay, 5 pp. *World Ports*, Oct. 1956.

STOCKS, G. R., They Called it the Island of Timber, 3 pp. *Trident*, July. Madeira.

TEAGUE, MICHAEL, Portuguese Guinea: an African Arcadia, 11 pp. *Geog. Mag.*, March.

VAN DONGEN, I. S., *The British East Africa Transport Complex* (Univ. of Chicago Dept. of Geography Research Rep. 38), 172 pp., processed. Chicago, The University, 1954. See also Hance & van Dongen above.

VILLIERS, ALAN, The Marvelous Maldive Islands, Sun-Drenched Atolls in the Indian Ocean, 21 pp. *Nat. Geog.*, June.

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WOOD, G. B., Whitby Recalls its Past, 4 pp. *Trident*, Aug.

WOODS, R. P., Resistance of Timbers to Marine Borers, 4 pp. *D&HA*, July. Includes brief historical survey and bibliography.

IX. *Shipbuilding and Allied Topics*

AXELSON, ERIC, The Burrard Dry Dock Co., 3 pp. *Can. Shipping & Marine Eng. News*, July. History of major Vancouver shipyard, created by Alfred Wallace in 1889.

BAMBERGER, WERNER, Air-Cooling of Passenger Ships Now a Basic Factor in Design. *N. Y. Times*, 13 Oct. v, 12. History of process since Mario Cosulich had it installed in liner 'Victoria' around 1930.

BANNER, EARL, Historic Replica: The Mayflower Shallop. *MCF*, March. Built at Plymouth.

BURNETT, C. B., *Let the Best Boat Win: the Story of America's Greatest Yacht Designer*, 266 pp. $3.50. Boston, Houghton, Mifflin. Biography of Nathaniel Greene Herreshoff, 1848-1938. See also Herreshoff, XIV, 227.

CHAMPNESS, E. L., Modern Dry Docks: Design, Construction and Equipment, Part I, General Survey, 7 pp. *D&HA*, Sept. Includes brief bibliography. To be continued.

DOWLING, E. J., see Sect. VII.

FAIRBURN, W. A., see Sect. III, for Vol. V especially.

HALLORAN, J. J., Boston's Shipbuilding and Ship Repair, 3 pp. *Marine News*, July. Includes pictures of three principal yards.

LADAGE, JOHN, Keep them Upright, 2 pp. *S&S*, Winter. Study of ship stability at King's Point.

ROLT, L. T. C., *Isambard Kingdom Brunel, A Biography*. 25s. London, Longmans. Creator of 'Great Eastern.' See also Dugan, XIV, 70, 147.

SMITH, R. A., The Love Affair of William Francis Gibbs, 10 pp. *Fortune*, Aug. Able and readable portrayal of the celebrated naval architect and his favorite creation, the liner 'United States.' Also in *Reader's Digest*, Nov.

Symposium on the Use and Welding of Aluminum in Shipbuilding. 32s 6d. London, Institute of Welding. 1956.

TOOTH, E. S., Cargo Handling and Ship Design. Modern Methods Require Modified Construction. 3 pp. *D&HA*, Sept.

U. S. Naval Ship Repair Facility, San Diego, 4 pp. *Bureau of Ships Journal*, Oct. History of activity, formerly U. S. Destroyer Base, 1922; U. S. Naval Repair Base, 1943.

WRIGHT, E. A., USN, The Model Basin Field Station: Lake Pend Oreille, Idaho, 4 pp. *Bureau of Ships Journal*, June. Subsidiary of the David Taylor Model Basin, with particular facilities for experimenting.

WRIGHT, J. M. P., JR., see Sect. XII.

X. *Naval to 1939—North America*

BEARSS, E. C., The Vicksburg River Defenses and the Enigma of 'Whistling Dick,' 10 pp. *Jour. Mississippi Hist.*, Jan. Legends surrounding Confederate gun used against Union gunboats.

BINDER, F. M., American Shipbuilding and Russian Naval Power, 1837-1846, 6 pp. *Military Affairs*, Aug. Building of 'Kamschatka' at New York and tours of Russian officers in America.

BRAISTED, W. R., The United States Navy's Dilemma in the Pacific, 1906-1909, 10 pp. *Pacific Hist. Rev.*, Aug. 'The military authorities debated whether the threat from Japan in the Pacific outweighed the requirements of the United States in the Atlantic.'

BROOKE, G. M., JR., *John Mercer Brooke, Naval Scientist*, unpub. Ph.D. thesis, North Carolina, 1955-56. Brooke was an early Annapolis graduate who 'went South' in 1861.

COULTER, J. W., *The Pacific Dependencies of the United States*. $6.75. New York, Macmillan. Includes account of naval administration of some of the islands.

First Yard-Built Naval Vessel Ends Career, 1 p. *Shipyard News* (Newport News). May-June. Scrapping of gunboat 'Nashville,' yard's hull no. 7, with pictures.

JEURICH, C. H., The Mantle of Valor, 5 pp. *Rudder*, June. Sketch of Commodore John Barry.

JOHNSON, R. E., *United States Forces on the Pacific Station, 1818-1923*, unpub. Ph.D. thesis, Claremont, 1955-56.

LONG, J. S., The Gosport Affair, 1861, 18 pp. *Jour. Southern Hist.*, May. The strange circumstances of the capture of Norfolk Navy Yard. 'The mental paralysis that existed on the eve of the great struggle allowed the secessionist leaders of Virginia to use the Gosport yard as a lever at a critical moment in the state's fearful debate.'

LUCKOCK, W. J., USN, The Old Navy Breed, 6 pp. *Skipper*, July. Loss of 'Memphis' on rocks of Santo Domingo, 29 Aug. 1916.

LYDON, J. G., *The Role of New York in Privateering down to 1763*, unpub. Ph.D. thesis, Columbia, 1955-56 (Dissertation Abstracts, Vol. 16, 1436).

MANCHESTER, WILLIAM, The United States Marines, 6 pp. *Holiday*, Nov. Includes group picture of former and present uniforms.

MERRILL, J. M., *The Rebel Shore: The Story of Union Sea Power in the Civil War*, 246 pp. $4.75. Boston, Little, Brown. Story of the blockade of the coast and the seizure of ports. See also West below.

MILLION, P. E., *The Influence of the Washington Naval Conference upon American Sea Power*, unpub. Ph.D. thesis, Georgetown, 1955-56.

NOGGLE, BURL, The Origins of the Teapot Dome Investigation, 30 pp. *Mississippi Valley Hist. Rev.*, Sept. See also Stratton below.

SMELSER, MARSHALL, Naval Considerations in the Location of the National Capital. *Maryland Hist. Mag.*, March.

——— Whether to Provide and Maintain a Navy (1787-1788), 10 pp. *USNIP*, Sept. By-products of author's study of earliest federal naval policy as Forrestal Fellow, 1956-57.

SNEATH, WILLIAM, USN, Two New Dewey Anecdotes. 2 pp. *USNIP*, Sept. Recalled by a onetime gunner's mate on 'Olympia.'

STRATTON, D. H., *Albert B. Fall and the Teapot Dome Affair*, unpub. Ph.D. thesis, Colorado, 1955-56. See also Noggle above.

TOLAND, JOHN, *Ships in the Sky: The Story of the Great Dirigibles*, 352 pp. $4.95. New York, Holt.

VAN DEURS, G., USN, A Naval Pioneer on Puget Sound. 2 pp. *USNIP*, Nov. 'Nipsic's' final 20 years, spent at Bremerton.

WEST, R. S., JR., *Mr. Lincoln's Navy*, 328 pp. $6.50. New York, Longmans. This gives promise of remaining the definitive comprehensive study of the naval side of the Civil War. The author, professor of history at the Naval Academy, is biographer of Gideon Welles, David D. Porter and others.

WHEELER, G. E., The United States Navy and the Japanese 'Enemy': 1919-1931, 14 pp. *Military Affairs*, Aug. 'The Navy enlisted the aid of any sympathetic source in its struggle to gain an up-to-date fleet.'

William Nelson, Lieutenant Commander, U. S. Navy; Major General, U. S. Army. *Shipmate*, Sept. One of the first Annapolis graduates was permitted to shift to Army service in 1861; was killed by a disgruntled subordinate in 1862.

XI. *Naval to 1939—Other Regions*

ABERNATHY, CECIL, *Mr. Pepys of Seething Lane: A Narrative Based on Pepys' Diary*, 384 pp. $6.95. New York, McGraw-Hill. See its index under 'Navy' and 'Navy Board.'

ADCOCK, F. E., *The Greek and Macedonian Art of War*, 128 pp. $3.00. Berkeley, U. of Cal. Press. Includes naval and combined-operations aspects.

AYLMER, G. E., Attempts at Administrative Reform, 1625-40, 7 pp. *English Hist. Rev.*, April. Naval administration.

DIECKMANN, E. A., Beach Head, 55 B.C., 6 pp. *Marine Corps Gazette*, Sept. Caesar's amphibious landing in Britain.

FORESTER, C. S., Hornblower and the 'Star of the South,' 14 pp. *Saturday Eve. Post*, 19, 26 Oct. The fictional hero, now an admiral, on frigate-flagship during chase and capture of a slaver in the West Indies.

GRAVIAND, J. F., French Navy, French Marines, 5 pp. *Marine Corps Gazette*, Sept.

KENNEDY, W. V., The Spanish Armada, 9 pp. *Marine Corps Gazette*, Oct. 'Take all the nightmares ever dreamed by amphibious planners, compound them with the worst possible leadership, throw in liberal doses of hard luck, add a revolution in tactics, and you have the story of disaster that was the Spanish Armada.'

LEWIS, MICHAEL, *The History of the British Navy* (Pelican Book, A400), 288 pp., paper. 85 cents. Baltimore, Penguin Books. A general narrative and analysis, 800-1945, not to be confused with his equally readable topical *The Navy of Britain: A Historical Portrait* (1948), XII, 86.

LINDSAY, J. O., see Sect. IV, Ch. 8, Eric Robson, The Armed Forces and the Art of War (1713-63); Ch. 18, M. A. Thomson, The War of the Austrian Succession; Ch. 20, Eric Robson, The Seven Years War; Ch. 22, J. H. Parry & Frank Thistlethwaite, Rivalries in America.

LLOYD, CHRISTOPHER, Robert Blake, 6 pp. *History Today*, Aug. Study of the great British admiral, who, without previous sea experience, whipped the Navy into a well-organized fighting force.

MARR, JAMES, Bluff upon Bluff, 2 pp. *ADW*. Encounter with von Luckner in the Society Islands.

MACKESY, PIERS, *The War in the Mediterranean, 1803-10*, 430 pp. 45s. London, Longmans. Already noted as Ph.D. thesis.

MALLALIEU, J. P. W., *Extraordinary Seaman*, 179 pp. 15s. London, MacGibbon. A condensation of Lord Cochrane's autobiography.

SPINNEY, J. D., Tenerife Invicta, 14 pp. *Blackwood's*, July. Conversations at Santa Cruz about Nelson's action and the loss of his arm in 1797.

UHLIG, FRANK, JR., The Battle Cruiser Era (Picture Section), 11 pp. *USNIP*, Oct. In addition to brief text, includes 18 pictures of battle cruisers from HMS 'Invincible' of 1908 to HMS 'Hood' of 1920 and the projected 'Lexington' class.

WARNER, OLIVER, Sunset at Sea: Napoleon's Last Voyage. *Quarterly Rev.*, Jan. To St. Helena with Adm. Cockburn in HMS 'Northumberland.'

XII. *World War II*

BRIDGES, ANTHONY, *Scapa Ferry*, 231 pp. 15s. London, Davies. Ferrying of explosives from mainland to Scapa Flow.

HARVEY, PETER, 'Ultimatum'—The Story of a Submarine, 8 pp. *Jour. Royal United Service Inst.*, Aug. Experiences of a British sub in the Mediterranean, including the sinking of a U-boat off Toulon.

JAMESON, SIR W. S., *Ark Royal, 1939-1941*, 371 pp. 30s. London, Hart-Davis. Account of the British carrier, including search for 'Graf Spee,' sinking of 'Bismarck,' and maintenance of Malta.

KEEBLE, PETER, RN, *Ordeal by Water*. 18s. London, Longmans. 'The great story of detection-cum-salvage activities beneath the surface as Fleet Salvage Officer in the Eastern Mediterranean.'

MAVIO, A. P., ed., *Records of the War Trade Board* (Preliminary Inventories, No. 100), 51 pp., processed. Free. Washington, National Archives. Includes wealth of entries on wartime blockades, contraband, ships, cargoes, etc.

MONKS, NOEL, *That Day at Gibraltar*. 15s. London, Miller. Adm. Sir Dudley North was relieved of command of the North Atlantic station in late 1940 after French warships left Mediterranean for Dakar, etc.

PAUL, W. P., Saga of Her Majesty's Ship 'Glasgow,' 5 pp. *Trident*, Aug. Includes brief accounts of former warships of that name.

ROBERTSON, TERENCE, *Night Raider of the Atlantic; the Saga of the U-99*, 254 pp., paper. 35 cents. New York, Ace Books. Already noted in 1955 Dutton edition, with different subtitle, XVI, 150.

ROOSEVELT, J. K., Saga of the 'Wakefield,' 5 pp. *U. S. Coast Guard Mag.* Wartime experiences of transport, former liner 'Manhattan.'

RUGE, FRIEDRICH, Fed. Ger. Navy, *Der Seekrieg. The German Navy's Story, 1939-1945*, c. 400 pp. $5.00 ($3.00 to members). Annapolis, U. S. Naval Institute. By the 'CNO' of the new Navy of the West German Federal Republic.

SCOTT, J. D., JR., USNR, No Hiding Place—Off Okinawa, 6 pp. *USNIP*, Nov. Experience of a Marine flier from 'Bennington' in combat with kamikazes.

WHELAN, JOHN, *Home is the Sailor*, 224 pp. 13s 6d. Sydney, Angus & Robertson. Account of 14 years in the Royal Navy, including experiences at Dunkirk and Frectown.

XIII. *Postwar Naval*

BALDWIN, H. W., The New Navy: A Reporter's Notebook, 3 pp. *N. Y. Times Mag.*, 13 Oct. Discussion of NATO maneuvers; see also his three articles in *N. Y. Times*, 1-3 Oct.

——— Ivan Goes to Sea, 3 pp. *Saturday Eve. Post*, 2 Nov. Account of present Russian Navy.

——— Nuclear Depth Charges. *N. Y. Times*, 27 Oct., 1, 36.

BARRY, DONALD, The British Navy in the Nuclear Age, 6 pp. *USNIP*, Oct.

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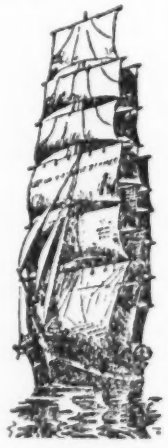

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